SPECIFICATIONS

FOR

Labor and Material

FOR

Harvard School Building

Toledo, Ohio

SPECIFICATIONS

For Labor and Materials Required for the Erection and Completion of the

Harvard School Building

Located on
Glendale and Princeton Avenues

Toledo, Ohio

ACCORDING TO PLANS AND SPECIFICATIONS
PREPARED BY THE

DEPARTMENT OF ARCHITECTURE
OF THE BOARD OF EDUCATION
TOLEDO, OHIO

EDWIN M. GEE
Architect

WM. E. HALLAUER
Structural Engineer

SAMUEL R. LEWIS
Heating and Ventilating Engineer

INTRODUCTION

The following specifications are intended to embrace and apply to all labor and materials, and to all persons interested in the erection and completion of the building.

DEFINITIONS

The Board of Education referred to in the following pages is the Board of Education of the City School District of the City of Toledo, Ohio. The Director of Schools means the executive officer of the Board of Education as defined by Statute, who is empowered to execute contracts for the Board of Education in the name of the school district. The Architect means the head of the Department of Architecture of the Board of Education. The Superintendent means any Superintendent, Engineer, Inspector or Clerk of the works on the building, representing the Director of Schools and the Board of Education.

INSTRUCTIONS TO BIDDERS

All bids shall be made and submitted, in accordance with the terms of the published Notice to Contractors, which is as follows.

NOTICE TO CONTRACTORS

Sealed proposals will be received in accordance with law, until 12 o'clock noon on the 1st day of May, 1925, at the office of the Clerk of the Board of Education of the City School District of the City of Toledo, Ohio, for the furnishing of material and the performance of labor required in the

erection and completion of the Harvard School Building situated on the school site at Glendale and Princeton Avenues, Toledo, Ohio, and known as the

"HARVARD SCHOOL"

The nature of the work to be done is set forth in the Drawings and Specifications for the same, prepared by the Department of Architecture of the Board of Education, Toledo, Ohio, Edwin M. Gee, Architect.

The Plans, Specifications, Proposal Forms, and Forms of Bonds and Contracts, are on file and can be seen at the office of the Department of Architecture of the Board of Education.

Copies of the Plans and Specifications will be furnished by the Director of Schools to any Contractor applying for the same. However, a cash deposit in the sum of $25 for each set furnished will be required, such deposit to be refunded upon the proper return in good order of said Plans and Specifications prior to May 15, 1925.

All bids shall be made and submitted on special blank forms to be obtained from Department of Architecture, Board of Education. Each bid shall be accompanied by cash, an approved Surety Company Bid Bond, or a Certified check upon a solvent bank, made payable to the Board of Education, Toledo, Ohio, in an amount equal to ten per cent (10%) of the bid tendered, as a guaranty that the bidder will, if the award is made to him, enter

into a bona fide contract with the Board of Education for the work and furnish the bond required under the Specifications. If for any reason whatsoever the bidder fails to enter into a proper contract and to execute a proper bond as required by the Specifications, the amount of such guaranty shall be retained by the Board of Education as and for liquidated damages sustained by reason of his failure so to do.

Every proposal or bid shall contain the full name of each person or Company interested in the same, and the labor and material bid upon shall be separately listed, prices and amounts being written in ink and expressed in words as well as in figures.

The date set for the entire completion of the work is August 1, 1926.

Attention of bidders is called to the laws of the State of Ohio, making eight hours the maximum hours of labor for any one day, on all public work.

The attention of bidders is called to paragraphs of the Specifications covering the time of completion and liquidated damages.

Bidders shall furnish satisfactory evidence of their experience and ability to construct work of like character in the time required. The Board of Education reserves the right to reject any or all bids, or to accept any bid which it may deem advantageous to the City School District of the City of Toledo, Ohio.

By order of the Board of Education.

R. S. WENZLAU,
Director of Schools

Specifications for Labor and Material

Bidders upon this work are cautioned to read the specifications for the same from beginning to end, in order to thoroughly acquaint themselves with the character and condition of the work as shown by the drawings.

Bidders shall, before submitting a proposal, visit the premises and ascertain the existing conditions of the site, and the fact that a proposal is submitted will be construed by the Board of Education to mean that bidder making such proposal agrees to carry out all work in full accordance with the provisions of the Drawings and Specifications.

TIME OF COMPLETION

Successful bidders on all or any portion of the work shall be required to enter into contract (see Art. 6 of the contract) to complete the work on or before **August 1, 1926.**

The completion of all work on or before the date specified will be considered an essential part of each contract and each Contractor engaged upon this work will be held strictly to the terms of his contract in this respect.

EXTENSION OF TIME

The time allowed for the completion of the work will be extended to offset delays occasioned by strikes or other causes, if it is clearly shown that the cause for delay is beyond the control of the Contractor and that he is in nowise responsible for the same.

No extension of time will be allowed on account of weather conditions or for rejected work or

material.

Each Contractor shall waive all rights to extension of time on account of delays caused by other Contractors engaged upon the work.

LIQUIDATED DAMAGES

It shall be understood and agreed to that the damages sustained by the Board of Education by reason of non-fulfillment of the terms of the contract shall be as follows:

General Contract Work, One Hundred ($100) dollars.

Steel Sash and Frames, One Hundred ($100) dollars.

Heating and Ventilating Work, Twenty-five ($25) dollars.

Plumbing and Gas-fitting Work, Twenty-five ($25) dollars.

Electric Wiring Work, Twenty-five ($25) dollars.

Automatic Temperature Regulating Work, Twenty-five ($25) dollars.

For each and every day said work is delayed or remains undone after the date set for the completion of the same, which sum or sums shall be deducted from the contract price, as and for liquidated damages.

GENERAL CONDITIONS

It shall be understood that all materials, labor, transportation, or equipment mentioned, shown or reasonably implied in the Plans or Specifications and necessary for the substantial completion of the work, shall be furnished in place completed, and

cleaned up by the contractor responsible therefor, unless otherwise explicitly provided in these Specifications.

All Contractors shall work in harmony and cooperate with each other in advancing the work, and all shall have equal rights upon the premises.

Contractors will be held responsible for all work embodied in their contracts, and shall not sublet any portion of their work without the written consent of the Director of Schools.

Contractors shall properly barricade their work, and shall erect and maintain effective shelter for all materials delivered on the site, to protect them from damage by the elements or otherwise. Barricades and proper signal lights shall be provided and maintained to insure the safety of workmen and the public.

The General Contractor shall provide and maintain telephone service of which the representatives of the Director of Schools and the Board of Education shall have free use. He shall also provide a suitable office with heat when needed for the inspector of the Board of Education.

Contractors shall not post, or permit others to post, any advertising matter of any kind upon the building or grounds without permission from the Director of Schools.

Contractors shall at all times provide sufficient facilities for inspection.

Contractors shall at any time, when so directed by the Architect or superintendent, clean up and

remove any and all rubbish produced by them, and at final completion of the work shall repair all damage and leave the building clean and in perfect condition.

All plastered surfaces are not to be defaced and same must be turned over to the owner in a clean and undamaged condition at the completion of the building. The responsibility of keeping the plastered surfaces clean and undamaged rests with the General Contractor.

Contractors shall give their personal attention to the work and shall furnish competent foremen to remain upon the work during its progress and until its completion.

Each Contractor shall in all cases lay out his own work, and he will be held responsible for its accuracy.

Each Contractor shall prosecute his work at the proper time without delay to other Contractors.

Each Contractor shall acquire the right to use any patented article, apparatus or method of construction that may be required in the Specifications for his work, pay all royalties and save the Board of Education harmless from any cost or expense arising from such use.

Each Contractor shall provide the means for hoisting and conveying his own materials about the building and the erection plant shall be of sufficient capacity to push the work without delay.

Each Contractor engaged upon the work shall

guarantee the Board of Education against damage caused by accident to the building, to materials stored in or about the premises, and against liability for injury to persons in or about the said premises during the construction and until the final acceptance of the work.

Any Contractor who shall either damage or destroy the work of any other Contractor, or the property of the Board of Education shall repair or make good the same at his own expense.

It shall be each Contractor's duty to watch the progress of the building and ascertain when and where his work will be needed, and he shall be prepared to begin the work promptly and shall proceed vigorously with its execution.

The General Contractor shall set the cast iron access doors furnished by the Heating Contractor.

The Director of Schools will not engage either to give advance notice to Contractors, or to notify them when to begin or to resume their work, and all Contractors will be held responsible for any and all consequences resulting through their neglect or carelessness.

All work shall be prosecuted with the utmost dispatch, and in case any Contractor shall delay the same through failure to provide or deliver the necessary materials and labor, or shall retard the regular advancement of the work through neglect, misconduct or inability, the Director of Schools may, after he has given said Contractor, his foreman, or clerk, a twenty-four hours' notice in writ-

ing, provide, at the expense of said Contractor, such materials and labor as he may think necessary to properly advance the work, and the Director of Schools will deduct all costs and charges thus incurred from any monies due said Contractor.

A full copy of all Plans and Specifications will be furnished by the Board of Education, which Plans and Specifications shall be kept on file at the building during the progress of the work, and shall be for the free use of every one interested.

All explanatory notes, etc., on the Plans shall be taken as part of these Specifications. The Drawings and Specifications are intended to supplement but not necessarily duplicate each other, hence work called for in the Specifications and not shown on the Plans or work shown on the Plans and not mentioned in the Specifications, shall nevertheless be executed by the Contractors in whose class the work clearly and rightfully belongs.

Failure to show or mention petty details shall not be warrant for the omission or anything necessary for the proper completion of the work to the entire approval of the Director of Schools.

Contractors shall not take advantage of any clerical errors that may develop in either Plans, Specifications or Details. Such errors, ambiguities or discrepancies shall be reported immediately by the Contractor to the Architect for his revision or correction.

Should it appear that any particular Specification conflicts or contradicts any statement in the General Specifications, that particular Specification shall govern.

Specifications for Labor and Material

The Contractor for any branch of the work will be held responsible for the proper execution of same. He shall therefor satisfy himself as to the correctness of the figured dimensions on Plans, by actual calculations, comparisons and checking, before ordering material or executing any part of the work.

Any explanations or interpretations of the Drawings and Specifications obtained by a Contractor or his agent from any employe of the Department of Architecture, which does not conform to the Drawings and Specifications, shall not be considered in the final settlement of the contract.

Whenever it appears to the Contractor or his Agent, that any material called for, or a method of construction shown on the Plans or mentioned in the Specifications, is faulty, impractical or insufficient to such an extent that, in his opinion, if carried out, would result in unsafe construction, or damage to persons or property, he shall instantly stop work on the parts in question and notify the Director of Schools at once, in writing, of such opinion and in what respect the Drawings and Specifications are at fault, and that part of the work shall not proceed further until the Contractor has received a written order from the Director of Schools.

ALTERATIONS AND MODIFICATIONS

The Board of Education reserves the right to make any alterations or additions or require omissions of any work or materials herein specified or shown on the drawings during the progress of the building that

they may find necessary or desirable, without notice to the surety or sureties on any bond, and the same shall be acceded to by the Contractor or Contractors engaged upon such work and carried into effect without in any way violating or vitiating the original contract. And the valuation of such alterations, additions or omissions shall be agreed upon in writing between the Director of Schools and the Contractor before being carried into effect. Verbal agreement for changes will not be recognized under any circumstances.

The Board of Education reserves the right to demand further securities when additions are made, if, in its judgment, such security is necessary.

The Board reserves the right to enter upon the premises at any time during the progress of the work and to install any work not included in the Plans and Specifications.

The right is reserved by the Director of Schools to require the immediate dismissal and removal from the premises of any incompetent or undesirable workman.

All work shall be executed in accordance with the laws and ordinances of the Building Department of the City of Toledo.

MATERIALS AND WORKMANSHIP

All materials mentioned in these Specifications shall be provided and put in place by the Contractors unless otherwise stipulated. All materials shall be new, and the very best of their respective kinds, unless otherwise stated. And where no name or

make is specified or referred to as a standard, goods equal to the very best in the market will be required.

SUBSTITUTIONS

When the make or name of an article is given, it shall be understood that such make or name is mentioned only in order that a standard may be established, and that goods other than those mentioned will be considered, provided however, that the Contractor shall state in his proposal the make or name of the goods upon which such proposal is based, and furnish a complete specification of the same.

In the event of the proposal not stating this, the goods originally specified or referred to as a standard, shall be used.

IMPROPER MATERIALS

Any material not in conformity with these specifications will be rejected by the Director of Schools and shall be immediately removed from the premises by the Contractor responsible for the same.

The installation of defective material shall in no way constitute an acceptance of same.

SAMPLES

Samples of materials bid upon shall be furnished the Director of Schools upon request.

BUILDING PERMITS

The Board of Education will take out the building permit, and the Contractor shall take out the permits necessary for the use of streets, sidewalks, sewers, etc., and pay all fees for the same.

WATER PERMIT

The General Contractor shall take out and pay for the water permit, and all Contractors using water shall pay for it in their just proportion, according to the rules of the Water Works Department of the City of Toledo.

CONTRACT AND BOND

The Contract which the bidder agrees to enter into shall be in the form adopted by the Board of Education.

Before commencing the work each Contractor shall furnish Surety Co. bond acceptable to the Board of Education, in a sum equal to fifty per cent of the contract, covering the fulfillment of the terms of the contract with the additional obligation, that such Contractor will make prompt and full payments to all persons furnishing him with materials or performing labor in the prosecution of the work, and save the Board of Education harmless from all costs resulting from his failure to do so.

Note—The amount of the bid for steel sash and frames will be added to the General Contractor's, and he shall be governed accordingly in estimating the cost of his bond.

Bond shall continue for twelve months after date of final certificate.

Each Contractor shall furnish to the Director of Schools a correct and full schedule of all quantities and prices of materials under contract, and upon which the contract is based. This schedule will be used only as a check upon estimated quantities at payment periods.

GUARANTEE AND BOND

These specifications require that certain work and materials be guaranteed for a specified time after the acceptance of the building and the final payment therefor. And an acceptable bond will be required which shall cover said guarantees in full force until their expiration.

The bonds required will be as follows, and shall run from the date of final certificate, for the term of years noted after each:

General Contract and all work in connection with same, including Steel Sash and Frames, One year.

Heating and Ventilating, One year.

Plumbing, One year.

Electric Work, One year.

Plumbing Fixtures, Two years.

Automatic Temperature Regulation, One year.

In addition to the above the following special bonds will be required:

Sidewalks and Paving, Five years.

Composition Roofing, Ten years.

Sheet Metal, Two years.

Water Closets, Five years.

NOTICE TO SURETIES

The final acceptance and payment upon the contract shall not be considered as conclusive evidence on the part of the Board of Education, that the provisions of the Plans and Specifications have been fully complied with, if it shall subsequently appear that the Contractor has willfully, fraudulently or through collusion, supplied inferior material or work-

manship or has departed from the terms of his contract.

In any case the Director of Schools shall have the right, notwithstanding such final acceptance and payment, to cause the work to be properly done, and satisfactory materials supplied to finish the work in accordance with the Plans and Specifications therefor, at the cost and expense of the Contractor and the Sureties of his bond and shall have the right to recover against the Contractor and his sureties the cost of such work, together with such other damages as the Board of Education may suffer by reason of the Contractor's default, the same as if such final acceptance had not been made.

PAYMENTS

Monthly payments will be made as the work progresses, upon the certificate of the Architect, based upon ninety per cent (90%) of the work actually done, and the final payment will be made after the work has been fully completed and accepted. All certificates shall be subject to the approval of the Director of Schools, and no payment made shall be construed as an acceptance of any defective work or material.

PHOTOGRAPHS

At the regular estimate periods, the Contractor shall furnish the Director of Schools with photographs, seven and a half by ten inches (7½"x10") in size, mounted on cloth and taken from stations or viewpoints as directed by the Architect, showing the condition and extent of the work at the time the

estimate is made. The photographs shall bear the name of the building and the date upon which they were made.

DRAWINGS

The General Drawings herein described are intended to co-operate with these Specifications and shall be considered as so doing. They are designated as follows:

GENERAL DRAWINGS

1. Site Plan.
2. Sub-Basement Plan.
3. Plumbing and Drainage Plan.
4. Basement Plan.
5. First Floor Plan.
6. Second Floor Plan.
7. Roof Plan.
8. Elevations and Sections.
9. Elevations.
10. Sections.
11. Plenum Details.
12. Exterior Details.
13. Exterior Details.
14. Exterior Details.
15. Exterior Details.
16. Exterior Details.
17. Exterior Details.
18. Exterior Details.
19. Exterior Details.
18. Exterior Details.
19. Exterior Details.

20. Exterior Details.
21. Exterior Details.
22. Auditorium Details.
23. Auditorium Details.
24. Steel Sash Details.
25. Stair Details.
26. Stair Details.
27. Standard Details.
28. Plumbing Details.
29. Mill Details.
30. Footing Plan.
31. Basement Floor Framing.
32. First Floor Framing and Basement Lintels.
33. Second Floor Framing and First Story Lintels.
34. Suspended Ceilings and Second Story Lintels.
35. Roof Framing Plan.
36. Details.

HEATING AND VENTILATING DRAWINGS

40. Sub-basement Plan.
41. Basement Plan.
42. First Floor Plan.
43. Second Floor Plan.
44. Details.
45. Details.

Together with supplementary details to be hereafter furnished, both to enlarged scale and full size.

All figures on Plans shall be taken generally in preference to measurement to scale.

Where figures are not given and the scale cannot be used, Contractors shall apply to the Architect for further information.

Details shall have preference over the general drawings. Any reference to the Plans or Drawings in these Specifications means all of the Drawings.

SHOP DRAWINGS

Working shop drawings, jointing plans, erecting plans, etc., hereinafter required, shall be submitted by the Contractors to the Architect for approval. Approval of shop drawings shall cover design and detail only, and shall not be construed as a check on the same. And such approval shall neither relieve the Contractor from his responsibility for proper construction nor from the necessity of furnishing the labor or materials required by the original Drawings but not shown on said shop Drawings, when approved.

DRAWINGS TO BE RETURNED

All Drawings furnished to the Contractors are and shall remain the property of the Board of Education. Contractors will be charged with Drawings and Specifications delivered to them and will be credited with same upon their return. For all Drawings lost, destroyed or not returned, the Contractors will be held responsible. Drawings shall be protected and used with care, by the Contractors, and when the work is completed, shall be returned to the office of the Board of Education.

CONTRACTS

In addition to the combined general and steel sash contract, separate contracts will be awarded on the following items:

Heating and Ventilating.
Automatic Temperature Regulation.
Plumbing and Gas-fitting.
Electric Wiring.

These specifications are intended to embrace and apply to all labor and materials necessary to entirely complete the building.

SCHEDULE OF UNIT PRICES

The party or parties to whom the contract is awarded, will be required to fill out and sign a schedule of unit prices before the first payment is made on account of the contract. Schedules will be prepared by the Architect and will include all that is needful in estimating payments due, and the cost of extra work or deductions from the contract.

REMOVALS

The General Contractor shall remove all trees and their stumps that would be less than 30'-0" from the outside lines of the new building, and shall box and protect all other trees.

All portable schools on the property will remain till the new building is completed, when they will be removed by the Owner, after which the finished grading shall be done by the Contractor. The house now on the premises will be removed by the General Contractor and shall become his property.

TEMPORARY WATER CLOSETS

A temporary water closet for the use of all men employed on the work shall be constructed. The

closet shall be placed in an approved location, and shall be built to meet the requirements of the City Departments and shall be kept in a sanitary condition at all times. When the work is completed, the closet shall be removed, and any vault cleaned, disinfected and filled up.

WAIVERS OF LIEN

No payment will be made on any certificate, until signed receipts or signed waivers of lien, for all material or labor are filed with the Director of Schools, or in lieu of the above receipts or waivers, the Contractor may file an approved bond, guaranteeing that all payments will be made.

EXCAVATION AND GRADING

(Read General Conditions)

WORK INCLUDED

Under this head is included all excavations necessary for the completion of the building, including all refilling and the grading of the whole premises. The excavation for the drainage is not included under this head.

EXCAVATION

All excavations shall be made to the depth shown on the drawings and laterally to the extent required.

The excavation shall extend at least one foot and six inches (1′ 6″) beyond the bottom line of the outer foundation walls.

Excavations for footings shall be cut true to dimensions, neither more nor less, and shall be made in exact position. They shall be left perfectly level at the bottom, free from water and loose earth and ready for the reception of concrete.

The Contractor shall provide means for freeing the trenches, etc., of water, either by pumping or connecting temporarily with the drainage system.

FILL

The excavated space around the outside walls shall be filled with earth, well tamped in place.

Where soft tile are laid around the walls, the four inches of fill against the walls, extending from the tile to the grade line, shall be of cinders, or blast furnace slag, and the soft tile shall be covered with the same immediately after inspection and approval.

Fill up under all basement floors that are not framed to a point 8″ to 11″ below finished floor,

and tamp solid in not over 10″ courses.

Sufficient earth from the excavation, to bring the grade up to the levels shown on the Drawings, shall be distributed about the building and any surplus earth shall be placed in the ravines, as directed, and leveled off.

If any additional earth is required to bring the property to the grades shown, same shall be furnished by the Contractor at his own expense.

The Contractor shall save all top soil and use the same for a top dressing for the finished grade.

The finished grading shall be done by this Contractor who shall leave same in proper condition for seeding and sodding. In general the grade shall be as shown. Where the present grade of the property is higher than the new grade indicated, this Contractor shall grade down to a point 6″ below the new grade and fill up to same with top soil.

The Contractor shall state in his proposal a price per cubic yard for all excavations required below the levels shown in the Drawings.

Additional work required and not shown on the Drawings will be paid for by the Board of Education at such unit price. Work called for by the Plans and Specifications and not executed will be figured on the unit basis and deducted from the contract price.

SODDING

This Contractor upon completion of the building shall sod a strip two feet (2′ 0″) wide along all walks, driveway, and around the walls of the building and shall sod the plots indicated on the plans.

For Harvard School Building

DRAINAGE

(Read General Conditions)

WORK INCLUDED

Under this head is included the excavations for the hard and soft tile drainage system, the refilling of said trenches after the drains are in place, the furnishing and laying of all hard and soft tile drains, the clear water basins, including setting of covers, and the connections with the Sewer. Note the line leading towards concrete culvert, and the concrete ending at same.

EXCAVATION

Trenches shall be excavated for all hard and soft tile drains shown on the drainage plan.

Bottoms of trenches shall be smooth and true and shall have a uniform fall to points of discharge or between levels established on Drawings.

Bottoms of trenches shall be solid, undisturbed earth, and where trenches enter or cross, filled ground, proper means of supporting the tile shall be provided.

Where lines of tile cross concrete footings or walls, the Contractor for drainage shall before the concrete is deposited, place in position a section of vitrified tile of sufficient size to admit of the tile drain passing through.

HARD TILE

Hard tile shall be sound, salt-glazed sewer pipe,

with full hubs, smooth and free from cracks or craze, and shall be the sizes shown on the Drawings. Where the tile change size, proper reducer and increaser sections shall be used.

Wherever tile connect with cast iron, the tile shall not be chipped with the hammer, but shall be ground to fit the hub of the cast iron pipe, and the Contractor for drainage with the Contractor for plumbing will be held responsible for the perfect alignment and jointing of said tile with said cast iron. All tile shall be laid with a uniform fall between levels established on Drawings and all the joints of the same shall be made with a ring of oakum, well-caulked into the joint and the joints shall be run full of a hot-poured bituminous product. A clay roll shall be used to make the joints and it shall be so put on that after pouring, the joint shall finish flush with the bell.

Material for such joints shall be a bituminous product of such character that it will not be affected by the ordinary sewer acids and wastes. It shall not be brittle at ordinary sewer temperature and shall give an entirely water-proof joint. It shall melt at a temperature under 200° F., and pour in a thin liquid under 400° F. It shall have sufficient ductility to allow for slight settlement without breaking of joints. (Submit samples.)

All connections shall be by means of Y branches, and proper fittings securely plugged and accurately located, shall be left for connection with the various cast iron drains as shown.

SOFT TILE

All soft tile marked "S. T." on drainage plan shall be No. 1 quality for four inch (4") soft tile. All elbows, bends and the terminals entering clear water basins, shall be hard tile. The soft tile shall be whole and sound and shall be laid with a uniform fall to points of discharge. All joints shall be neatly butted and covered with a three inch (3") strip of tar paper. After the tile have been laid, inspected and approved they shall be covered with six inches (6") of course river sand or cinders. Note the soft tile under ducts and floors.

FILLING

When the work has been inspected and approved by the Superintendent, the trenches shall be refilled with earth and tamped solid in eight-inch (8") courses to the surface.

CLEAR WATER BASINS AND SUMPS

The clear water basins and sumps shall be constructed of hard burned brick laid in Portland cement mortar, or of concrete, and shall be watertight. They shall be provided with cast iron covers with frames and shall be of sizes shown on the Drawings.

All cast iron manhole frames and covers in connection with the drainage work will be furnished under structural steel contract.

CONCRETE WORK

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor, material and equipment necessary for the satisfactory completion of all plain and reinforced concrete work herein described or shown on the Drawings.

The concrete ducts are included in this contract. (See Detail).

All methods or devices used for carrying out the work shall conform to the best up-to-date practice, and shall at all times be subject to the approval of the Director of Schools.

UNIT PRICE

The Contractor shall submit unit prices for cement finish, concrete, concrete forms and steel separately upon which basis settlement shall be made for deductions from, or additions to, the work shown on Plans, or herein specified.

ANCHORAGE

The setting of all anchorages required throughout the building for the connection of other materials to the concrete is included under this head and especial care shall be taken to keep such anchorage in position while the concrete is being deposited.

HOLES IN CONCRETE

Holes shall be left where shown on the Drawings and elsewhere as directed or as may be required by other Contractors.

Outlet boxes, conduits, and other necessary provisions for electric wiring in the floor slabs will be furnished and installed by the Contractor for electric wiring who shall be given free access to the building and such assistance as will enable him to promptly and properly install his work.

CEMENT FINISH

Where cement floors are required, they shall be made with cement mortar one-inch (1") thick mixed in the proportion of one (1) part cement to one and one-half (1½) parts clean, coarse sand, which shall be approved by the Director of Schools. The mortar shall be placed at the same time as the body of the floor and trowled to a smooth finish. The Contractor shall take special care to properly protect all finished cement surfaces, as they will not be accepted until the completion of the contract.

Note: The concrete walls of Room No. 12 and the risers of platforms in Room No. 12 shall be rubbed with sandstone and water to a smooth finish.

The basins for shower baths shall be formed in the floor, as per detail, and finished with cement mortar.

CONCRETE FLOORS

The cement floors in basement, except framed floors, those over ducts, and except those as here-

inafter noted as double floors, shall be made with a three-inch (3″) slab of concrete plus the one-inch (1″) finish on a four-inch (4″) layer of clean cinders, leveled up and well tamped in place. The floors of boiler room, ash storage, gymnasium, coal room, pump room, and underground ducts, shall be of two thicknesses of stone concrete with water-proofing between the first thickness four inches (4″) and the second thickness three inches (3″) including the finish coat.

Should the Ironite system of waterproofing be used, the floors noted above as double floors, shall be of a single layer of concrete four inches (4″) thick on a three-inch (3″) layer of clean cinders. The concrete shall be smoothed off to receive the water-proofing following which the finish is to be applied if called for.

Where wood floors are required by the Carpenter the top of concrete slab shall be three and three-eighths inches (3⅜″) below finished floor. One and three-fourths inches by three inches (1¾″x3″) beveled nailing strips shall be laid on the slab by the carpenter, spaced sixteen inches (16″) on centers, and carefully leveled up. The space between the strips shall then be filled with concrete leveled off with the top of the nailing strip.

All floors shall be properly graded to the floor drains or outlets. The concrete floor of the toilets Nos. 3, 10, 103, 110, 203, 210 and of toilets of Rooms Nos. 2, 114, 115, 118 and 214 shall be left without the finish coat and the top of

slab shall finish one and one-half inches (1½") below the finished floor. Note the drop of floor under the urinals of boys' toilets.

All niches of every kind shall, after pipes are in place, be stopped at the floor line with concrete so as to leave no communication from story to story.

In all rooms and corridors of the basement that are plastered and also have cement floor, the floor shall be joined to walls with a two-inch (2") cove.

CONCRETE DUCTS

The main air ducts shall have walls of brick, or concrete as indicated, floors shall be of concrete as specified above. The curved ends of ducts shall be of concrete.

The branch ducts to the plenum chambers shall have double concrete floors same as main ducts, ends of branches shall be turned up with a curve. Note the floor slab over the branch ducts in the plenum chambers, also decks in plenum chambers which shall be placed by this Contractor at time designated by the Heating Contractor.

CONCRETE ROOFS

The main roof and roofs over Coal and Boiler Rooms, Coal Storage, and Ash Storage, shall be a reinforced concrete slab, properly troweled smooth on top to receive the roofing. These roofs shall be cast with the correct pitch to throw the water to down spouts, as indicated.

Leave openings in all roofs for down spouts, plumbing pipes and ventilators, and after same are in place fill in tight about same with concrete.

CONCRETE VENT STOPS

The vent spaces (two in all) of the main toilets of the second floor shall be covered with a concrete slab 3" thick and after plumbing work is completed the openings around all piping passing through the slab shall be carefully pointed up and made air-tight.

STONE CONCRETE

The concrete used in this work shall consist of cement, fine and coarse aggregates, mixed with a sufficient quantity of water to obtain a rather wet consistency, but not sufficiently wet to cause a separation of materials in placing. The relative proportions of cement, fine and coarse aggregates, shall be 1, 2 and 4 respectively for all footings and reinforced work and 1, 3 and 5 respectively for unreinforced work. The unit of measurement shall be a sack of cement weighing about ninety-four (94) pounds assumed at one cubic foot in volume.

Portland cement of one brand, satisfactory to the Director of Schools, shall be used throughout on the work, and it shall be delivered to the site and conform strictly to the requirements of the standard specifications for cement adopted by the American Society for Testing Materials, Revised 1916, and shall be tested by the Robert W. Hunt & Co., reports of tests for each car shall be furnished the Director of Schools before cement is used.

SAND

The fine aggregate shall consist of sand which shall be free from all injurious matter, and the maximum

particles of which will pass through a screen having one-fourth inch (¼") diameter holes.

STONE

The coarse aggregate shall consist of crushed limestone or air-cooled blast furnace slag which is retained on a screen having one-fourth inch (¼") diameter holes, the maximum particles passing a screen with one inch (1") diameter holes.

The fine and coarse aggregate shall at all times be subject to the approval of the Director of Schools, both as to its quality and relative proportions of intermediate particles.

STEEL

In general the reinforcing steel shall consist of plain round rods or shaped rods acceptable to the Director of Schools, as noted on the structural drawings, having an ultimate strength of from 55,000 to 65,000 pounds per square inch, and shall conform to the specifications for structural steel of the American Society for Testing Materials, dated 1911, revised 1914, except that the elastic limit shall not be less than 32,000 pounds per square inch.

The Contractor shall satisfy the Director of Schools by reports of tests that the material he proposes to use conforms to these specifications.

The plans contain sufficient information on the steel reinforcements to enable Contractors to make estimates, but the detailed plans for bending and placing, and exact lengths of rods for ordering shall be prepared by the Contractor and submitted to the

Director of Schools for approval. Note: All suspension rods for all suspended ceilings shall be provided and placed by this Contractor.

FORMS

All forms for concrete work shall be so designed, erected and supported that the dimensions of members will be accurately preserved without serious deflection or distortion in finished work. After erection and final bracing of forms they must be carefully checked over by the Contractor for plumb and alignment.

Rough lumber may preferably be used for all concrete work where the surfaces are plastered.

Forms for floor and roof slabs shall be steel tile, satisfactory to the Director of Schools, as shown by the structural drawings. Removable steel forms may be used if the Contractor so desires, providing the extra cost of the electrical installation, made necessary by their use, is born by this Contractor.

DETAILS OF CONSTRUCTION

MIXING CONCRETE

All concrete shall be mixed with a batch mixer of approved type, except where in the opinion of the Director of Schools it should be necessary or expedient to mix by hand, in which case the mixing shall be done in a manner satisfactory to the Director of Schools. Concrete which has partially set shall not be used.

PLACING CONCRETE

Concrete shall be thoroughly puddled or tamped with proper tools for that purpose, while being deposited.

CONSTRUCTION JOINTS

Care must be taken by the Contractor in the matter of location and design of construction joints in the concrete work and the Director of Schools shall be consulted at all times in this regard.

In general, construction joints shall be made at the center of floor slabs midway between the floor beams.

Additional reinforcements will be required at construction joints wherever deemed necessary by the Director of Schools, and the old surface of concrete wherever new work is joined thereto, shall be carefully cleaned off and grouted as directed.

REMOVAL OF FORMS

The time which must elapse between the placing of the concrete and the removal of the forms will depend upon the atmospheric and other conditions, and the Director of Schools shall be notified and his approval obtained before supports are removed from the forms. For the information of Contractors in estimating, it may be stated that during warm weather the following rules will be carried out in general with respect to removal of forms.

The forms may be removed from the floor slabs in not less than two weeks. The forms for walls may be removed in not less than one week. Forms of rubbed walls and the risers of platforms of Room No. 12 shall be removed as soon as practicable.

CLEANING FORMS

All forms shall be thoroughly cleaned of all sawdust, shavings or other matter, before concrete is placed. This shall preferably be done by water under pressure, temporary drain holes being made in the forms if necessary. All forms shall be wetted thoroughly before concrete is placed.

CONCRETING DURING EXTREME WEATHER

Concrete shall not be placed during freezing weather, unless special precautions are taken to heat the materials before mixing and to protect the work in an approved manner until the concrete has finally set.

During hot weather concrete shall be kept wetted down until thoroughly set.

REINFORCING STEEL

In general, all reinforcements shall consist of round rods placed as shown on the steel schedules on the several floor plans and footing plan. Note the extra reinforcement required around openings in floors and roof.

BENDING AND PLACING STEEL

Reinforcing steel shall be bent wherever required, avoiding sharp angles at the bends. Special care shall be taken by the Contractor to get the rods in their proper places, and means shall be taken, by wiring or otherwise, to prevent their displacement during concreting.

Spiral reinforcing shall be bent to a true curve and accurately spaced and held by at least two spacing bars to each spiral, spirals eighteeen (18") inches or more in diameter shall have three mechanical spaces. In spirally reinforced columns the vertical rods and spiral shall be wired together at intervals not exceeding the diameter of the columns.

Floor slabs having reinforcement in more than one direction shall have intersecting rods tied with wire at least twice in each space.

In walls the intersecting rods shall be tied with wire at not less than one-half the intersections.

Diameters given for column spirals are inside diameters.

In hooped columns the hoops may be welded or lap sufficiently to develop the full strength of the rod used.

Column splices shall be made at the slab and the vertical steel shall be offset below the slab for any change in the dimensions of the column above.

Stirrups in all beams and girders shall be securely wired in position before concrete is placed.

CLEANING STEEL

All reinforcing steel shall be cleaned of all dirt or foreign matter before placing, but a slight coating of rust is not objectionable.

POINTING UP

After removal of the forms, the Contractor shall carefully point up all defects which may appear in the concrete surfaces.

After the steel sash are in place this Contractor shall fill in behind the side jambs and head of sash for the full width of the section with cement mortar.

TESTING

Structural work not exceeding five per cent of floor construction shall be tested at such times and in such manner as the Director of Schools may direct, but at the Contractor's expense, and any defects due to carelessness on the part of the Contractor or to faulty workmanship, shall be corrected.

CONCRETE SIDEWALKS

All outside walks and steps, shown on the Drawings and marked or indicated as concrete, shall be put in by this Contractor.

All shall conform to the proper grades, and shall be true to line.

Excavate under the walks so the bottom of excavation shall be eleven inches (11″) below the top of finished walks; level off and ram solid. Fill in this excavation to a depth of six inches (6″) with screened soft coal cinders well-rammed.

On the cinders place the concrete four inches (4″) thick, same shall be made of approved Portland cement one part, clean sharp, coarse sand two parts, and clean crushed stone to pass a three-fourths inch (¾″) mesh five parts; cement and sand shall be mixed with broken stone until all is thoroughly uniform, and immediately put in place and well-rammed.

Broken stone shall be well drenched to remove the dust. No material that has begun to set can be used and no more concrete shall be laid than can be covered with the top dressing on the same day. Whenever any concrete in place has begun to harden it must be thoroughly roughened up and well wet before any other concrete is laid.

The walks shall be divided into flags, as directed, with one thickness of tarred paper or a sand joint between.

Before the concrete has set, lay a finish coat one inch (1″) thick to consist one part of above cement and one and one-half (1½) parts of clean, sharp, coarse sand, thoroughly mixed dry, then wet up to the proper consistency of plastic mortar, carefully leveled on top to straight edge and floated straight and true but not enough to make a slippery surface. All lines shall be straight and true and the corners rounded, as directed.

The surfaces shall be protected and kept damp by spraying while setting.

This Contractor shall do all excavating and back filling for this work.

The Contractor must give a bond warranting the walks, free from any defects of material or construction for a term of five years from date of acceptance, and any defect arising from any faulty material or construction, during that period, must be repaired at his own expense.

CONCRETE PAVING

The concrete paving as shown shall be put in by this Contractor.

It shall be constructed similarly to the sidewalks except that the excavation shall be 12″ below finished grade and that the concrete shall be five inches thick, plus finish with expansion joints not more than twenty feet (20′) apart. The finish shall be one-inch thick as required for the sidewalks, but the same shall be scoured across the pavements every five inches (5″). Scouring shall be large enough to hold horseshoe calks. A four-inch concrete curb 6″ wide shall be provided where shown on the drawings

CONCRETE WALLS

This Contractor shall build the reinforced concrete retaining walls shown on the drawings at both east and west entrances, and the walls of building as marked or indicated on the plans.

The concrete materials shall be mixed in the proportion of one part cement, two parts sand, and four parts stone.

The reinforcing steel shall be of the size, and bent as indicated on the drawings. The reinforcing shall be well tied together with wire to prevent displacement, while the concrete is being deposited.

The forms for the walls shall be well tied together and braced to preserve alignment. This Contractor shall furnish and set the tile bleeders as indicated. Note: For details see Sheet Nos. 30 and 31.

WATERPROOFING

The tops of all walls and footings at a point level with the bottom of the basement floors, shall have a good coat of hot asphaltum or coal tar pitch, in which the Contractor shall imbed one thickness of coarse burlap and then cover with another coat of asphaltum or pitch.

All exterior walls, and all walls about the coal room, ash room, boiler room, pump room, and gymnasium, up to the underside of basement floor or up to the grade, and the first layer of concrete of the floors of these rooms and walls and bottoms of underground ducts and ejector pit shall be waterproofed as follows:

Walls and floors shall be cleaned of all loose dirt and dust and then shall have a good coat of Barrett specification pitch, applied hot with a mop, then a layer of Barrett specification tarred felt put on vertically while the pitch is still hot and lapped about three inches (3″); laps cemented together with hot pitch. Cover this felt with hot pitch as above and then put on a second layer of felt applied

horizontally and pressed in to the hot pitch and lapped about three inches (3"), and cemented with the pitch. Cover this layer of felt with a good coat of the hot pitch which must be spread evenly over the entire surface and left to harden.

Care must be taken to press the whole surface of the felt into the hot pitch, and only as much pitch can be put on as can be covered with felt before same becomes cold.

ALTERNATE FOR WATER PROOFING

The tops of all walls and footings, at a point level with the bottom of the basement floor slab shall be treated with three (3) brush applications of Ironite Waterproofing, followed by one Ironite cement slush coat.

All exterior walls and all walls about the coal room, ash room, boiler room, pump room, and gymnasium, up to the basement floor or up to grade shall be thoroughly cleaned and waterproofed with ⅜-inch cement plaster to which has been added Ironite waterproofing. Over this the Contractor is to apply two Ironite brush applications followed by one Ironite cement slush coat.

Note: The plaster coat may be omitted on concrete walls.

The interior surfaces of all duct walls and ejector pit shall be waterproofed with three brush applications of Ironite followed by one Ironite cement slush coat and one Ironite cement brush coat.

For Harvard School Building

The floor slabs of the following rooms: Coal room, boiler room, ash storage, pump room, gymnasium, ejector pit and duct floors shall be treated as follows: cleaned and pointed with waterproofed cement mortar, then receive four Ironite brush applications and one Ironite bonding coat. Bonding coat is to be applied as Contractor is laying his cement finish. This finish to be laid under the waterproofing Contractor's supervision.

At all joints between walls and floors or footings this Contractor is to provide a waterproofed cement coving.

The waterproofing contractor is to furnish an acceptable surety bond that all parts treated by him will be and will remain waterproof and water-tight, he to make any repairs to defective waterproofing should they become necessary within a period of five years from the date of completion of the building.

All material is to be delivered to the job in sealed cans bearing the manufacturer's name and trademark, known as the Ironite Waterproofing of the Ironite Company, Tinley Park, Chicago, Ill.

Note: The material specified above is mentioned only as a standard and other materials of equal waterproofing effectiveness will be considered.

Note: The concrete slabs under the two small stone roofs and the inside faces of the two retaining walls at the East and West entrances shall be waterproofed by the method selected from the above specifications.

STRUCTURAL STEEL AND CAST IRON

(Read General Conditions)

WORK INCLUDED

Under this head is included the furnishing and erection of all cast iron and structural steel, including beams, girders, trusses, columns, lintels, bearing plates, bolts, bars, separators, manhole frames and covers for clear water basins, frames for toilet room vent spaces, together with all manner of anchorage necessary for the satisfactory completion of the building, as shown by the plans or herein specified.

WORK NOT INCLUDED

The steel framing for the main tower stairs and platforms is not included.

The iron doors to the plenum chambers in basement, and the reinforcing steel for concrete, and all materials specified under heading of "Ornamental Iron Work" are not included under this head.

SHOP DRAWINGS

Complete shop drawings of all work shall be approved before the work is executed, as specified under "General Conditions".

WORKMANSHIP

Workmanship shall be first class in every respect and in accordance with the standard approved Specifications, except as may be noted below or on Plans.

Material five-eighths inch (⅝") thick or less may be

punched, the diameter of the punch being not more than one-sixteenth inch (1/16") nor that of the die one-eighth inch (⅛") larger than the diameter of the rivet. Material more than five-eighths inch (⅝") thick shall be punched and reamed, or drilled from the solid.

Punching shall be done accurately, and slight inaccuracies in matching holes shall be corrected by reaming.

Special attention must be paid to riveting in order that the finished work will present a neat appearance. The rivet heads shall be of approved shape, full, of equal size, and concentric with the rivet. All defective riveting shall be cut out and replaced.

STEEL

All structural steel shall have an ultimate strength of from 55,000 to 65,000 pounds per square inch, and shall conform to the specifications for structural steel of the American Society for Testing Materials under date of August 16, 1909, except that the elastic limit shall not be less than 32,000 pounds per square inch.

CAST IRON

Cast iron wherever required shall be tough gray iron, free from cold-shuts or blowholes, true to pattern and finished up in a workmanlike manner.

MANHOLE COVERS

Manhole frames and covers shall be cast iron and of sizes shown on Drawings. Minimum thickness of metal shall be one-half inch (½") for inside work. Inside covers shall be flat, with checkered surface.

Each cover shall be provided with a lifting staple which shall drop into a countersink flush with top, when not in use.

A clean-out door and frame twenty by twenty inches (20″x20″) shall be placed at the base of the smoke flue in basement.

Manhole frames and covers for coal room shall be as detailed on sheet No. 30 and shall be provided with an approved locking device.

Covers for clear water basins and sumps shall be eighteen inches (18″) in diameter. Cover for sump shall be open bar strainer to fit into hub of 15-inch tile.

STEEL LINTELS

Provide steel lintels for all exterior openings where so shown or marked, as detailed. Note angle girts to be bolted to concrete lintels of window openings, same together with bolts to be provided by this Contractor. See details.

Where ducts pass under walls provide the lintels as noted on the drawings.

Provide steel lintels for all openings into flues and plenum chambers, and where metal ducts pass through walls. Lintels for all other of the above openings shall consist of ⅜″x2″ bars for openings up to and including 2′ 8″ width and 4″x4″x⅜″ angles for openings over 2′ 8″ wide. There will be two bars for openings in 4″ and 8″ walls; three bars for opening in 12″ walls and four bars for opening in 16″ walls. When the 4″x4″ angles are used, there

should be one for 4″ walls, two for 8″ and 12″ walls and three for 16″ walls.

Note that some of the partitions between vertical heat flues do not extend down to the floor (see ¼-inch scale sections of plenum chambers) provide two ⅜″x2″ bars for each of these partitions to rest on. All of the above bar lintels shall have 4″ and angle lintels 6″ bearing at each end.

Provide lintels for openings where smoke breaching passes thru walls and enters smoke stack.

Provide ⅜″x2″ bar lintels for the clean-out door of the smoke flue and for openings in foul air flues.

Provide lintels for the exhaust fan flues.

All interior openings in brick walls, not arched, shall have steel lintels as detailed.

VAULT DOORS

Provide and set over the ash hoist, a pair of vault doors with frame. Masonry of hatchway will be six feet by five feet (6′ 0″x5′ 0″) door shall be steel or malleable iron with heavy brass hinges, and shall have proper locking device and approved device for holding doors in the open position. Metal work of doors and the frame shall be galvanized. Joints between doors and between doors and frame shall be water-tight and the frame shall be set with a pitch to throw water. Frame shall be set flush with the top of coping of the ash hoist, being countersunk into same by this contractor and made thoroughly water-tight.

BEAMS, GIRDERS, TRUSSES AND COLUMNS

All steel work shall be placed as shown and of the sections marked.

All beams and girders resting in masonry walls shall also have bearing plates, as per the schedule, and shall also have bent pin anchors, government style.

Where steel work is bolted to the masonry this Contractor shall provide the bolts, etc., and shall give the exact location of same to the Contractor for the brick work. Note the steel work at toilet vent spaces, detail on sheet No. 33.

Note Auditorium roof trusses, Auditorium balcony girder, girder beams over Gymnasium and under class room walls. All members shall be of the size and weight specified and workmanship equal to the best grade of bridge work.

Steel purlins of Auditorium roof shall be set to the amount and direction of pitch indicated.

Note: The steel columns and girder beams over boiler room.

PAINTING

All structural steel and cast iron, except such as is embedded in concrete work, shall be thoroughly cleaned and given one coat of approved pure red lead and linseed oil paint before leaving the shop. In riveted work the surfaces coming in contact shall be painted before assembling. After erection all exposed metal work shall be painted with an additional coat of pure linseed oil paint of such quality and color as may be selected by the Director of Schools. Work which is inaccessible after erection shall be given two coats of paint before erection.

All planed surfaces of cast iron shall be coated with pure white lead or tallow before leaving the shop.

ORNAMENTAL IRON

(Read General Conditions)

WORK INCLUDED

Under this head is included all stair rails, hand rails, grilles, ladders to scuttles, stairs of boiler room, main tower stairs and framing, wire guards, brackets, pipe rail and seat supports in gymnasium, balcony rail, window guards, frames for electric fixture openings in gymnasium ceiling, ash hoist, metal grilles in doors, and all manner of cast iron, wrought iron or steel work, not specified under the heads of structural steel and concrete work. Note: The wrought iron vent grilles in terrace wall and pipe rail and guard chain of compressor room are included.

WORK NOT INCLUDED

The iron doors and frames to the plenum chambers, all registers, valves, diffusers, and other metal work in connection with the heating and ventilating system will be furnished by the Heating Contractor. The brass piping in connection with the toilet and shower stalls is not included under this head. The steel sash frames and casements are not included under this head.

SHOP DRAWINGS

Shop drawings of all work shall be approved before the same is executed, as specified under "General Conditions."

CHECKING DIMENSIONS

Dimensions for all ornamental iron shall be secured at the building.

WORKMANSHIP

Workmanship shall be the very best of its kind and all work shall be done in strict accordance with the details for same and to the satisfaction of the Director of Schools.

CAST IRON

All cast iron work shall be made straight, smooth and true to pattern, free from blow holes, cold shuts or other defects. All mouldings shall be sharp and well defined.

FINISH

All finished ornamental iron shall be painted two coats of approved metallic paint. The finish shall be dull black to match Bower Barff.

BOILER ROOM STAIRS

Provide and set the stairs shown in Room No. 5, same shall have channel or cast iron strings, checkered cast iron treads and platforms and a neat rail of 1½" pipe as detailed on sheet No. 27. Contractor shall supply all supports for these stairs.

STAIR RAILS

Provide and set wrought iron pipe hand rails on both sides of all stair cases where shown. The rails shall be of 1½" pipe in single lengths for each run, bent as required for ramps and easements, and set up free from buckle or crimp. They shall finish at ends with balls with moulded neckings to match the diameter of the rails, set into same and riveted tight with rivets filed smooth.

Rails shall be secured to walls with strong, heavy, special cast and malleable iron adjustable hold-fasts (see detail) secured with two expansion bolts to solid brick walls. The hold-fasts shall be set not to exceed 5′ 0″ on centers, and top of stair rails shall be set 2′ 4″ above top of stair treads on a line with the face of risers.

BALCONY RAIL

Provide and install the wrought iron rail with cast iron posts for the Auditorium balcony, same shall be as detailed on Sheet No. 27, secured to wood top and to walls as shown.

LADDERS

Ladders extending from the second floor to within 1′ 0″ of roof, shall be placed in janitor's closets near Room No. 205.

Rungs shall be made of ¾″ diameter rods, bent to form, and shall be 18″ wide with a 4″ projection from face of wall. Rungs shall be spaced about 16″ apart, and shall be built into the brickwork about 8″ with ends turned up 2″. Place a similar ladder 3′ 0″ high in void space over Dressing Room, one 12′ 0″ in Ejector Room, and one 12′ 0″ high in Fresh Air Intake in main tower.

FRESH AIR SCREENS

Provide and install the screen at opening of the fresh air intake in main tower. Screens shall be built up as detailed on sheet No. 15 of 1″ x 1″ angles, frames of ¾″ steel grooves vertical and horizontal bracing, and shall be covered with galvanized wire cloth, made of No. 14 wire and hav-

ing ½" diagonal mesh. Screens shall be made to tightly fit the openings and shall be secured to masonry as detailed.

ASH HOIST

Provide and erect the ash hoist in ash storage, same shall be the G. & G. or equal approved telescopic hoist, with compound gear and brake attachment, and with wrought iron grapples for ash can. (Gillis & Geoghegan, 537-539 West Broadway, N. Y. City). The ash hoist shall be of sufficient height to allow the ordinary size ash can to swing clear of the curb at hatchway.

PIPE RAIL

Provide and set the pipe rail in Room No. 12, same shall have 2" stanchions and 1½" lower and upper rails, all secured together with pipe rail fittings. Stanchions shall be let into concrete at least 8" and shall have slip flanges secured to concrete. Rails shall be secured to walls and columns with screw flanges, which shall be secured with bolts as detailed on sheet No. 27.

Provide and set the pipe rails in Ejector Room, Storage Room No. 112B, at top of Auditorium vent flue, and at Library entrance as indicated.

FRAMES

Provide and deliver to the Electrical Contractor the angle frames and rings detailed on sheet No. 27 for electric fixture openings in the ceiling of Room 12, eight required.

FLAG POLE

Provide and install in the playground, where directed, a 60′ steel flagpole with weatherproof telescopic joints, heavy copper ball (covered with gold leaf) ball-bearing revolving halyard truck, and halyard cleats. Pole shall be set in concrete at the base by this Contractor. Halyard cleats shall be 6′ 6″ above wall at east entrance.

Provide and install the halyards, same shall be ¼″ diameter bronze tiller rope, made endless.

Pole shall be painted two coats by this Contractor.

WINDOW GUARDS

Basement windows of Rooms No. 1, 2, 3, 4, 5, 6, 6A, 7, 8, 9, and Library coal room, shall have wire guards, provided and set by this Contractor, all as shown by details on Sheet No. 27.

Guards shall have 1⅛″ angle steel frames and No. 10 wire with 1″ diagonal mesh. All guards supported as detailed and each shall have approved brass padlock, all locks to pass with the same key; six keys. Locks furnished by this Contractor.

MISCELLANEOUS

Provide fastenings, pulleys and wire cable for stereopticon curtain in Auditorium as shown on Sheet No. 23.

Furnish four hooks securely anchored to the ceilings in Rooms Nos. 201, 202, 204 and 205. The location will be given by the Superintendent.

Specifications for Labor and Material

Provide and install the two warm air grilles in Auditorium. These shall be of cast stove iron with angle iron frames secured to brick jambs and grilles hinged to frames and secured with latch. These grilles shall be made as shown with all angles and mouldings cleaned out, all lines run true and straight and fronts to a true plane.

Provide the carpenter with the metal grilles for doors; these shall be of stamped steel not less than 12 gauge, ¾" mesh and ¼" bars. Grilles shall be finished and leveled both sides.

For Harvard School Building

CUT STONE WORK

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor and materials, including anchors, necessary for the satisfactory completion of all cut stone work, including the stone ashlar and trim of all walls, towers, platforms, terraces, and steps as shown on the drawings or herein specified.

PROTECTION

Protect all cut stone work in the most thorough manner, until the completion of the building, by securely covering with plank all projecting work, angles, jambs, steps, bases, etc., and make good any work damaged in any manner whatever.

MATERIAL

All the stone ashlar and trim under this heading shall be of first quality, Whitehouse stone, Sandusky limestone and No. 1 grey Indiana limestone similar to "Dark Hollow" quarried by the Consolidated Stone Co. Where rock face is indicated on the drawings it shall be Whitehouse stone and only where the stones are so large that it is not practical to use the Whitehouse stone, the Sandusky limestone shall be used.

The rock face projections shall vary from 2½" at the base of the wall to 1" at the top, care being exercised in selecting the stones for size and shade in order that the walls shall have the character represented on the plans.

The Indiana limestone shall be used at all places where rock face is not indicated. All steps, platforms, door sills, copings, top of smoke stack, etc., shall be of Indiana limestone. The exposed faces of the Indiana limestone shall be rubbed except the vertical faces of the basement window lintels, which shall be rock face, and in some cases where the Indiana limestone works in with the rock face ashlar.

WORKMANSHIP

Work to the existing conditions and the figures and do not use scaled dimensions. Take down and rebuild without extra cost, all work found not to be strictly level, straight, plumb, or that is defective in any way.

All stone shall be cut with perfectly true and level beds and builds, and to the exact dimensions shown. Make all beds and builds full, true and square for their whole depth; no stone shall be less than four-inch (4″) bed, and all projecting stone shall more than balance. Ten per cent of the superficial area of the stone facing shall be boarded to the backing by header stones at least four(4″) inches thicker than the facing. Backs of all stone shall be cut vertical, and generally square, except where turning corners. All vertical joints where rubbed Indiana limestone is used shall extend through to back of stone and shall not exceed one-eighth inch (⅛″) in thickness, bed joints shall be one-quarter inch (¼″).

All vertical joints and bed joints where rock

face is used shall not exceed one-half inch (½") in thickness.

Cut all reveals with full heads jointing at back where abutting other work. Carefully cut all intersecting profiles, etc., all re-entering angles shall be cut from the solid, no mitre joints will be accepted. No lewis holes shall be cut that will show in the finished work.

Where the buttresses are indicated as rock face and they form the jambs of the class room windows, they shall be bush-hammered on the side jambs between the sash and the line of the building wall. The jambs of all windows where rock-faced stone is indicated shall be brush hammered.

The rear returns of the flanking piers of both East and West entrances and the splayed face of the corner buttress at Room No. 114 shall be bush-hammered as indicated on the details.

All door sills shall be in one piece to extend through to inside of door, and shall have saddle cut on same under door and jointed on the inside.

Cut all throatings on the underside of all sills, and projections, washes on top of all sills and copings.

Do all cutting, drilling and fitting required to properly fit the stone work to adjoining work and to receive the work of other Contractors.

Cut all joggles, joints, rabbeted, moulded, weathered and throated work, curves, chases, anchor and other holes, back joints, reglets for flashing, etc., for receiving structural steel, iron, wood or other work.

Provide special anchors at all places where required and as directed.

Each piece of stone shall be securely anchored in wall with galvanized anchors.

Wash down and clean the whole exterior of the stone work, at the completion of the building, with clean water, brushes and sponges, and leave in perfect condition. No acid shall be used in cleaning stone.

All stone shall be set by experienced stone setters in full beds (except outer edge) and backs plumb and true; no wedging will be allowed. The Contractor shall replace at his own cost any stone injured, defaced or stained by the setters or others.

A sufficient number of trimmers shall be kept on the job so the work will not be delayed.

All stone work is to be treated on exposed faces and beds and one (1") inch back from face on ends with "Clear Dry Wall."

All Indiana stone work shall be set with approved non-staining cement, and shall be plastered on the back with same. All stone work shall be pointed up after trimming off all inequalities and raking out joints to a depth of one inch (1") with cement and fine sand half and half; sills shall be hollow bedded and pointed up at completion.

JOINTING

All jointing shall be done in accordance with the Drawings so far as shown. Steps and platforms shall be housed and built in. Thresholds of all entrance doors shall be cut out for the brass strike plates of

the door hardware, and lead the holes for screws.

The cap of smoke stack and foul air stack shall be anchored together with ¼"x1½" irons, galvanized and let into stone and holes filled with Portland cement.

The stones of the main tower where indicated and where necessary shall be dowelled or anchored together with galvanized anchors.

Set under all coping stone and cap of smoke stack, copper sheets which will be furnished by the Sheet Metal Contractor.

All joints of coping shall be grouted full with liquid cement and neatly pointed.

SAMPLES

Samples of Stone shall be submitted to the Director of Schools for approval, and all stone used in the work shall be equal in all respects to the approved samples.

DRAWINGS

The Contractor for the cut stone work shall make complete and accurate setting diagrams of all cut-stone work, showing how all work will bond with the wall.

Submit the setting diagrams in duplicate to the Architect and receive his approval before commencing any part of the work. The Architect will carefully check and endeavor to discover any errors that may exist in any diagram submitted, but the Contractor alone shall be responsible for the correctness of his own drawings and any detail work afterwards found to be incorrect (including any other

work affected thereby) shall be rejected and made good by the Contractor for the stone work at his own cost. The Architect will retain one copy of each drawing submitted, returning to the Contractor the other copy with his correction or approval. Any errors discovered shall be corrected by the Contractor and duplicate copies re-submitted until finally approved by the Architect.

Mark each and every piece of stone to correspond to the setting diagrams.

CENTERS

All arches shall be turned over wood centers which will be furnished by the carpenter contractor.

BRICK WORK

(Read General Conditions)

WORK INCLUDED

Under this head is included all materials, labor and equipment necessary for the satisfactory completion of the brick work, the setting only of all steel and cast iron work, including beams, girders, lintels, bearing plates, iron doors, grilles and all bolts, anchors, rods, ties, etc., required for the connection of steel construction to the brick work.

Where only the setting of material is specified the Contractor shall understand that the material itself will be furnished by other Contractors.

The Contractor for the brick work shall construct all pipe chases, leave all necessary openings as shown or as may be directed, brick in all ducts, flues, pipes, frames, etc., cut all holes necessary for the installation of material by other Contractors, repair all damaged parts and leave the work clean and complete to the entire satisfaction of the Director of Schools.

CHECKING AND SETTING OUT

The Contractor for the brick work shall check all previous work before setting out his own. He shall neither rely on, nor accept former dimensions, but lay out his own work according to the figures given on the Drawings.

He shall assist the carpenter in setting all arch centers, door and window frames, and when these are in position he shall see that they are kept plumb

and square as the walls go up. All window and door jambs and heads shall be carefully constructed as shown and all walls shall be left ready for plastering except as hereinafter specified.

ARCHES

Arches shall be turned over all openings not provided with lintels. The wood centers for arches will be furnished by the Contractor for carpenter work.

BEARING PLATES

All bearing plates shall be accurately located and shall be solidly bedded in Portland cement to the exact level required.

All brick shall be laid level and true to a line on both sides and all walls shall be carried up plumb and straight and carefully leveled for floor and ceiling joists and beams.

Interior walls shall be laid up tight to the under side of floors.

All brick work shall be laid up wet except in freezing weather.

All brick work shall be thoroughly bonded.

All brick shall be laid in full beds of mortar and all cross joints shall be filled solid.

Solidly back all sills with brick, cutting and bonding closely with same. All walls shall be built up together, no part being more than scaffold high above adjoining work.

Build all necessary ledges, corbels, piers, manholes, pits, etc., as required for all lines of work, build or cut all chases, recesses, etc., straight, true and

clean, with struck joints. All walls shall be carried up so as to course with the brick facing.

CORBELS

Where indicated on the Drawings, brick work shall be corbeled out to support concrete floor slabs, plenum decks, etc.

DAMP COURSE

All outside walls around the entire building shall have a damp course of slate the full thickness of the walls, the slates lapping joints at least one inch.

ANCHOR BOLTS

Build in all bolts furnished by other Contractors, locating same as directed by them.

NAILING BRICK

The Mason Contractor shall provide and set nailing brick for the carpenter to secure his grounds, for all wood finish.

These nailing brick shall be placed where directed by the carpenter and shall be similar and equal to those made from Nailcode.

OPENINGS FOR HEATING CONTRACTOR

Build all openings in walls required by the Heating Contractor and set the irons over same. Openings shall be of size and positions marked, and this Contractor shall consult both the general and heating Drawings for the size and location of same.

This Contractor shall level all walls perfectly and shall spread a good bed of mortar for all plates, etc.

All joints in above brick work shall be cut joints where plastered, and struck joints where exposed to

view. All joints in all flues not plastered, shall be struck flush.

All heat, vent, foul air flues that are of brick, shall be smoothly plastered one good coat as they are laid up. This plastering shall be done by the Contractor for the brick work.

All heat stacks, and all interior brick walls of second floor, not including the 5″ walls, shall be carried at least 3″ above the ceiling of the second floor. All vent stacks shall be carried to within 20″ of the bottom of the roof joists.

Care shall be taken with the walls of all plenum chambers and vent spaces, to make same air tight.

COMMON BRICK

All work shown as brick on the Drawings, except the exterior facing and hollow brick lining of exterior walls, and the 5½″ partitions, shall be of best quality hard burned common brick, same shall be square edged, well shaped and of uniform size, and free from clinkers, swollen or broken brick, and shall be satisfactory to the Director of Schools.

Walls shall be laid to line both sides with courses truly horizontal.

The interior facing of all exterior walls shall be of first quality hard burned hollow brick, common brick size, grooved for plaster key, thoroughly bonded with the walls. All openings in the hollow brick showing on the inside of walls shall be filled with cement.

The walls between toilets and vent spaces shall be 4″ thick and shall rest on steel angles, solid brick

from the angle up 18" hollow brick above.

The 5½" partitions, except at heat and vent flues, shall be of hollow brick or tile, and shall start from the floor slab.

Note the brick walls, and piers of roof space as shown on Drawings.

Build the heat and vent flues of the size shown and marked, partitions between flues shall be bonded into walls.

Build the smoke stack the size shown and line on the inside from the bottom of breeching to a height of forty (40') feet above same with approved No. 1 fire brick, laid in fire clay. Carry up 4" x 8" terra cotta flues for the range from Room No. 18 and from the fire place of Room No. 118. Carry up 8" x 12" terra cotta flues for the heater of Room No. 2 and one from a point 6' 0" above the floor in Room No. 9. Provide and place 6" thimble in flue from Room No. 18, 9' 0" from floor.

The outside facing of all exterior walls, except as indicated, below grade, and the whole of the smoke stack, except the exposed facing and the fire brick lining, shall be of foundation brick, thoroughly bonded in with the walls.

LUMBER RACK

Provide and build in ¾" galvanized iron pipe, in the wall of room No. 8 for the lumber rack, as shown by detail on Sheet No. 29.

ALTERNATE FOR HOLLOW TILE

The bidder will state in his proposal, how much he will deduct from his bid if hollow tile are sub-

stituted for common brick, as follows:

All work above the first floor level shown as brick on the Drawings, except the facings, and the work noted below, shall be laid up of 8"x12"x12" and 4"x12"x12" hard burned terra cotta building block.

Blocks shall have 6 cells for the 8"x12"x12" and 3 cells for the 4"x12"x12", walls shall be at least ⅝" and partitions ½" thick, and tile shall be capable of safely sustaining a load of five tons per square foot on all sides. 8"x12"x12" blocks shall weigh not less than 34 pounds each. Tile will be tested for strength by the Director of Schools and if they fail to meet the above requirements they will be rejected. Outside faces of tile shall be grooved to form key for plaster.

In general, the tile shall be laid on the flat bed. The brick facing shall be bonded to tile backing with approved galvanized steel wall ties, spaced 8" in height vertically, and not over 8" apart horizontally.

Where stone facing is indicated above the first floor level walls shall be of solid brick with hollow brick lining, same as basement walls.

Hollow tile shall be evenly burned and shall run fairly uniform in size.

A sample of the tile shall be submitted to the Director of Schools for his approval, and all tile shall be equal to the approved sample.

Whenever it is impracticable to use the above tile, and for all piers, and pilasters, and at niches and corbels, and all jambs and corners for not less

than 8" and for all arches, use a good quality of hard burned common brick, same shall be square edged, well shaped and of uniform size, and free from clinkers, swollen or broken bricks, and shall be satisfactory to the Director of Schools, and shall be bonded with the tile. Brick sidewall for a distance of 3'0" above all stairs, shall be of common brick.

Piers between 10' 0" windows of class rooms except where concrete columns are called for shall be of solid brick on first floor. The piers, above the second floor level, below which concrete columns are indicated, shall be of solid brick.

The walls of the main tower where shown as double wall shall be of solid brick or brick and stone as indicated.

Where concrete floor slabs bear on or in the walls, build in three courses of common brick under them for a bearing.

Where beams or girders bear on the walls the tile of the two courses under them and 12" each side of the center of bearing shall be filled solid with concrete, or common brick may be used.

Where girders that are headers, or carry masonry walls, bear in the walls, said walls under the girders shall be of concrete filled tile or common brick the full height of the story.

All piers and arches in the roof space shall be of solid brick carried up to the proper level for the roof beams.

The walls between toilets and vent spaces shall be 4" thick and shall rest on the steel angles, solid

brick from the angle up 18", hollow brick above.

The sill on the room side of all windows in Rooms 4, 5, 6 and 14 shall be sloped at an angle of 45 degrees.

MORTAR

Mortar for brick work throughout shall be mixed in the following proportions: Portland cement one (1) part; clean sharp lake sand, three parts (3), and small quantity of lime putty added to facilitate its working. Portland cement of one brand shall be used and shall accord with the Specifications for cement under concrete structural work.

All sand and water shall be heated during freezing temperature and salt shall be used where so directed by the Architect.

If a mechanical mixer is used, it shall be a batch mixer.

ALTERNATE FOR CARNEY MORTAR

The bidder will state in his proposal, how much he will deduct from his bid if Carney Cement is substituted for mortars, as follows:

For all brick and tile walls above first floor level, not including face and glazed brick, terra cotta and stone work, use one part (1) Carney, three parts (3) clean, sharp sand (no lime), in accordance with the manufacturers' directions attached to cement bags. Note: In the event of cold weather preventing the use of Carney cement, the mortar as specified for brick work shall be used to complete the work.

FACE BRICK

The building shall be faced on the exterior where marked or indicated with tapestry brick as selected by the Director of Schools. The Contractor shall estimate these bricks at twenty-five dollars ($25.00), per M., F.O.B. Toledo. If the brick selected cost more than the above, the owner will pay the extra cost to the Contractor, if they cost less, the owner shall receive a credit equal to the difference.

Bricks shall be laid up in Stretcher Bond with every fifth course a header course. The only exception being the faces of towers that are crossed marked on the elevations and these are to be English Cross Bond. The vertical joints for both Bonds are to be plumbed.

Face brick shall be bonded to the backing by means of the header courses, 20% of these being whole brick built into the wall.

Face brick shall be laid up to course as shown, in general courses are 3", in white mortar, with all joints cut.

All arches shall be as shown, and those over eight-inch (8") face or four-inch (4") reveal shall be bonded; brick for all arches shall be cut or ground to a radius.

All ornamental brick work shall be as shown.

If hollow tile is used for the walls all face brick shall be bonded to the backing with approved galvanized steel wall ties, spaced not over 9" in height vertically and not over 8" apart horizontally.

Note the special moulded bricks required at the cornice line as shown on elevations and as detailed on sheets Nos. 12 and 14.

All exterior brick work shall be cleaned down and pointed up as necessary at completion.

PROTECTION

Carefully cover all walls during all cessation of the work, at night and during storms, with heavy building paper or tarpaulins and boards weighted down. Heat all sand and water used during freezing temperature. The Contractor shall not do any work in freezing weather without the consent of the Director of Schools. The Contractor shall carefully protect the work against injury by the elements, and if work is ordered to cease entirely during the winter he shall box over the tops of the walls, etc., with planking battens, etc., properly nailed and secured, and close all openings in like manner and leave all tight and weatherproof.

MORTAR FOR FACE BRICK

Mortar for face brick shall be same as for common brick, except that light colored sand and white cement shall be used.

PRESSED BRICK

Brick for the fireplace of Room No. 118 shall be selected hydraulic pressed brick (iron spot), shades selected by the Director of Schools, laid up as shown in brown mortar. Lining of fireplace shall be of fire brick, laid on the flat bed of fire clay. Provide and set a Covert improved fireplace damper (H. W. Covert Co., 71 Murray Street, N. Y. City) for the throat of the fireplace.

PRESSED BRICK LINING

All walls of Room No. 12 from the top of the floor up to the ceiling, shall be lined with approved salt glazed brick. Brick shall be of uniform size and color, with full arises and shall be laid up in full stretcher courses. Brick shall be secured with steel ties same as face brick. Brick shall be laid up in lime mortar gauged with Portland cement, colored to match brick, with all joints struck flush. Brick shall cost $37.00 per M., F. O. B. Toledo, and shall be selected by the Director of Schools. Note that sills of windows in this room shall be covered with the same brick.

MARBLE, SLATE AND TILE WORK

(Read General Conditions)

WORK INCLUDED

The tile floor, base and wainscot of toilets Nos. 3, 10, 103, 110, 203 and 210, and the floor and base of toilets of Rooms Nos. 2, 114, 115, 118 and 214 and marble thresholds; the marble tops of all brick balustrades of stairs, and the slate treads, risers, platforms, and strings of the stairs.

The tile floor and base of Corridor No. 13 and the tile floor and border of the terrace is included.

WORK NOT INCLUDED

The slate work for all the toilet and urinal stalls and of the shower baths will be provided and set by other Contractors.

TILE FLOORS

The concrete under all tile floors will be left down so the tile setter will have one and one-half inches (1½") for his tile and bed. Floors of the toilets shall be of first quality tile "Sparta glazed ceramics," size 1"x2", color sand gray with the field laid basket weave and a 6" border in straight lines at right angles to weave of field.

The floors shall be brought to the proper level and thoroughly prepared for the floors with strong cement mortar.

Tile shall be thoroughly bedded and shall finish to true planes. Tile shall be hammered down so that the cement comes to the surface and thoroughly

fills all joints. Note: Urinals shall be set one and one-quarter inches (1¼") below level of floor and tile floor shall be pitched to urinals from a point two feet (2'-0") away from same.

Provide and lay the promenade tile floors in Corridor No. 13 and on terrace. The tile shall be selected semi-vitreous, rectangular, wire cut red tile.

In general the tile shall be 6"x9", but 6"x6" and 3"x9" tile shall be used for fillers where necessary to make a first class job.

The tiles shall be uniform in color and shall be straight and have a smooth finish and perfect arrises.

The tile shall be laid on a bed of approved cement mortar, composed of two parts clean sharp sand and one part Portland cement. Tiles are to be solidly bedded and laid to a true and level surface, with uniform joints not exceeding ½" in width. All joints shall be filled solid with dark colored cement mortar and pointed flush with the surface, leaving the tile perfectly clean and showing perfectly defined arrises.

Tiles shall be neatly fitted around all angles and projections. The finished floor shall be free from defects of any kind, and when the work is completed all surfaces shall be thoroughly cleaned, oiled and covered with sawdust.

TILE BASE

Provide and set in the above toilets a plain sanitary tile base, 6" high, of white enameled tile.

TILE WAINSCOT

Provide and set in the above toilets Nos. 3, 10, 103, 110, 203 and 210, a tile wainscot with plain moulded cap, four feet (4′ 0″) from floor to bottom of cap. Walls shall be thoroughly prepared by the tile setter. Tile shall be three by six inches (3″x6″) first class white enameled tile guaranteed not to craze.

The tile base, wainscot and cap shall extend into frames at all openings where there are no wood casings, and shall have curved tile at all angles and corners. All joints shall be as thin as possible and all joints filled with Keen's cement.

Windows in these toilets shall have stool formed of tile.

Provide and lay the hearth and back hearth for fireplace in Room No. 118, same shall be 6″x6″ selected quarry tile with joints spaced about ⅜″ and filled with black cement mortar.

MARBLE THRESHOLDS

At all doors where wood or tile floors join floors of other construction, place threshold of dark polished Tennessee marble. They shall be one and one-eighth by five and three-fourths inches (1⅛″x5¾″), set one-eighth inch (⅛″) above top of floors. All thresholds shall be solidly bedded and shall have corners slightly rounded.

When thresholds occur in 5½″ walls they shall be as above, but 5½″ wide.

BALUSTRADE TOPS

Provide and set on top of brick walls forming balustrades about the stairs, a stool of dark, polished Tennessee marble, same shall be 1¼" thick and shall project ½" each side of walls, with rounded edges. These stools shall be thoroughly and solidly doweled in position and shall have perfectly smooth joints. Point up neatly under above stools.

SLATE STAIRS

Provide and set the slate risers, treads, platforms and strings of the stairs of best quality clear black Bangor slate. Treads and platforms shall be 1½" thick with top face rubbed and bottom face planed, and shall have nosings slightly rounded. Risers and strings shall be ⅞" thick with exposed faces rubbed. Top of strings shall be chamfered. Strings shall be carried all around platforms and stop at the back of the top tread at floor levels. They shall be carried around balustrade walls to meet the main walls of the stair wells. Provide a slate stop 1⅜"x4"x8" for all points where the slate strings abut the base.

These slate strings shall have all necessary ramps and easements so they shall join together and with the wood base, and the risers housed and the treads fitted in between, all as shown by the scale detail.

The treads shall be set on the concrete stairs and secured with dowels. The concrete will be put in by other Contractors to within 1" of underside of treads.

Note that the main tower stairs between first and second floors have steel strings and cast iron risers.

All the above tile and marble work shall be first class in every respect, and shall be left a complete and finished job. All lines shall be level and plumb and floors and walls shall be made to form true planes. All shall be left thoroughly clean when the building is turned over to the owner.

All tile, marble and slate work shall be properly protected from damage from any cause, and if any damage should occur, such portions shall be replaced by the Contractor for this work at his own expense.

LATH AND PLASTER

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor and material necessary for the satisfactory completion of the lathing including the steel furring for same, and plastering, including all cement wainscot and cap of same.

Note that the walls of the Gymnasium are not plastered.

STEEL FURRING

Provide and set all the steel work for all suspended ceilings as shown and detailed. Channels shall be cold rolled of the size indicated and shall be carried from the work above by means of ¼" rods installed in the concrete.

Note that in the Auditorium the ¼" rods are suspended from holes in web of purlines.

Provide and set all other steel furring necessary to complete the design as shown.

LATHING

All ceilings, except those of Rooms Nos. 4, 5, 15, 15A and 16, Fresh Air intake and Ejector Rooms, and those of all plenum chambers, shall be lathed.

The soffits of all concrete stairs that are exposed shall be furred and lathed.

All concrete girders, columns and lintels that are plastered shall be lathed.

All niches and chases in walls shall be covered with a strip of lath, extending at least four inches onto wall each side.

The ceilings of Toilet Rooms Nos. 103 and 110 and of toilets of Rooms Nos. 118, 114 and 115, and of Auditorium and entire second floor shall be suspended.

Lath the heads of all openings so that the plaster may be carried into the frames or sash.

All lath shall be painted, metal lath of proper weight to span the furring spaced not more than 16″ on centers, and shall be thoroughly secured to same with annealed wire with ends twisted together and turned in.

All ceiling lath shall be turned down for a distance of four (4″) inches on all walls and partitions and securely fastened.

Lath for all ceilings where steel forms are used, shall be laid on the forms before steel tile is placed, lath shall be run at right angles to the concrete joist and shall be secured to each joist with wire not over 12″ centers, wire shall be properly embedded in the concrete of joists. Joints in lath shall be securely wired together not over 12″ apart. Wire shall be annealed and shall have ends turned in.

Where it is necessary to use centering for the lath, small channel sections shall be used and not the pencil rods.

Lath shall in no case be less than twenty-four (24) gauge nor weigh less than 3¾ lbs. per square yard, or if of punched sheet metal 26 gauge weighing not

less than 6½ lbs. per yard, and a sample of same shall be approved before the work is begun. Any other lathing than that mentioned above, required to make a complete and finished job of the work, as indicated by the Drawings, shall be done by the Contractor at his own expense.

PLASTERING

Except as noted below, all lathed work shall be plastered two coats, and brick and concrete surfaces one coat of lime mortar and a finished coat of lime putty.

There will be no plastering in the plenum chambers, coal room, boiler room, engine room, fan room, pump room, ash storage, or in the fresh air intake and ejector room.

Where cement wainscot is shown or specified, omit the lime mortar and plaster as specified under that head.

Note that the bottom of all steel beams that show in rooms that are plastered are covered with metal lath and shall be plastered. Note: In general the jambs and heads of openings shall be plastered into the frames, and the corner formed by the face of wall and the jamb shall be rounded with a ¾" radius. Note the ornamental plaster work in auditorium.

All plaster shall be perfectly uniform, true and hard. All angles, corners and arises shall be plumb and straight.

Plaster shall extend close up to all grounds and down to floors. There will be no plastering back of

blackboards, or slate that sets against the wall, except back of blackboards on exterior walls. Plaster one good coat back of cupboards, and in vent spaces of toilets.

Before beginning the work the plasterer shall carefully examine all grounds and assure himself that the same are in place, well secured and perfectly plumb and true.

All grounds shall be one-half inch on brick walls except at door jambs where they shall be three-fourths inch, they shall also be three-fourths inch for lathed work. Thoroughly point up with cement plaster, under all sills of windows in exterior walls.

Plaster all sloping sills of interior windows.

All surfaces which are to be plastered shall be thoroughly cleaned of all dust and dirt.

Plaster shall be mixed in the following proportions:

SCRATCH COAT

One part of pure fresh burned, ground lime putty and two (2) parts of clean, sharp sand, with a sufficient quantity of unsalted long cattle hair.

BROWN COAT

One (1) part lime putty and four (4) parts clean, sharp sand.

FINISH COAT

Twelve (12) parts lime putty gauged with plaster of Paris and one (1) part very clean sand.

All of the above shall be thoroughly mixed, tempered and applied in the best possible manner.

All surfaces which are to be plastered shall be thoroughly cleaned of all dust and dirt, and brick and concrete surfaces shall be wet before plaster is applied.

Each coat shall be perfectly dry before the next coat is applied.

CEMENT WAINSCOT

Rooms Nos. 6 and 14 shall have a cement wainscot and cap.

Wainscot shall be of height so the cap will come directly under the head jambs of the doors between rooms and corridors.

WAINSCOT CAP

All wainscot shall have a cement cap. Same shall be three (3") inches high and shall project one-half (½") inch from face of wall.

Cement wainscot shall be put on in two coats, the first coat shall be scratched and allowed to harden before applying the finish coat.

If dry, the first coat shall be sprinkled with clean water before finish is applied. For all lathed surfaces, clean, long cattle hair shall be mixed with first coat.

Cement shall be mixed in the following proportions:

FIRST COAT

Two (2) 100-lb. sacks Best Bros. Keene's cement, and one and one-half (1½) bushels lime, one (1) cubic yard sand.

FINISH COAT

Three (3) 100-lb. sacks Best Bros. Keene's cement one (1) bushel lime, one-half (½) cubic yard sand.

Specifications for Labor and Material

All sand shall be good, clean and sharp. All lime shall be well slacked and run through a fine mesh sieve. All mortar shall be thoroughly mixed, tempered and allowed to stand at least fifteen (15) days before using.

FINISH

All plastering shall be neatly straightened and troweled smooth, the finishing coat of lime putty shall be free from cat faces, brush, or trowel marks, and shall be kept down to grounds and straightened to perfect planes. Grounds shall be scraped clean.

All cement wainscot shall be troweled to a fine, smooth surface.

Note finish in Auditorium. All plaster moulds shall be run up with lime putty; same shall be straight and true with all corners and angles made with mitering tools and shall be securely anchored.

These moulds may be cast if the Contractor so desires.

Repair, patch and point up all plastering at completion, cutting out same where necessary, point around trim and other set work, and leave all complete and perfect, and satisfactory to the Director of Schools.

SHEET METAL WORK AND ROOFING

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor and material necessary for the satisfactory completion of the sheet metal work and roofing as shown on the drawings or hereinafter described.

The copper roof and finial on main tower and copper roof over corridor at Auditorium side of main tower is included.

WORK NOT INCLUDED

All ducts, valves, diffusers, risers, dampers, and all manner of interior sheet metal work in connection with the heating and ventilating system will be furnished in place by the Contractor for Heating and Ventilating.

GENERAL

All work in connection with roofs shall be made perfectly water tight, and the Contractor shall guarantee his work against leakage or other imperfections for a period of two (2) years for sheet metal, and ten (10) years for roofs dating from the issue of the certificate for final payment on the contract.

MATERIAL

All flashings shall be 16 oz. cold or soft rolled copper. All the copper used for the above mentioned roof shall be of 16-oz. soft (roofing temper) copper sheets. All roofings shall be of Barrett

specification materials, or of equal approved quality.

FLASHING AND COUNTER FLASHING

The intersections of all roofs with walls, stacks, ventilators, curbs, etc., shall be flashed with soft copper carried into the felt of roofing at least six inches and up on walls at least twelve inches and secured to the wood sheathing, or to the brick work. When this flashing comes under window sills it shall be turned under same and pointed up.

Flashing about curb of scuttles shall be carried up and over top of same.

All flashings except those that extend under sills, shall be counterflashed with cold rolled copper. The counterflashings shall extend well down over the flashings, and shall be turned into brick work. The counterflashing shall be carried up at least 12 inches above roof.

Do all other flashing and counter-flashing necessary to make a water-tight job.

Note the flashing at the east end of Auditorium where it is carried over the coping as indicated on sheet No. 7.

All the above flashing and counter-flashings shall have proper expansion joints which shall be made weather-proof and close enough together so that expansion and contraction will not open up the soldered joints. All other joints shall be locked and soldered with half and half solder and rosin, no acid. Cover the roof scuttle with approved 1C tin, having a coat of not less than 40-lb., thoroughly locked and soldered.

COPPER UNDER STONE WORK

The Sheet Metal Contractor shall provide the Mason Contractor with 16 oz. copper sheets tinned both sides to go under the stone caps of all stacks and under all stone copings. Copper for stacks shall be one and one-half inch (1½") wider than thickness of brick wall; copper for copings shall project one-half inch (½") beyond the exterior face of walls and one inch (1") beyond the interior face of wall.

COPPER ROOFS

The roofs over the main tower and corridor at Auditorium side of main tower, as detailed on sheet No. 15 shall be standing seam copper roofs. The wood ridges shall be placed by the Carpenter Contractor but the Sheet Metal Contractor shall see that these are well secured with all nails well set, truly lined and evenly placed. Before laying the copper over the wood sheathing cover the entire surface with an approved quality felt, rosin sized, or asbestos, as the Director of Schools may select. The paper shall be as wide as possible and secured with copper nails. The copper sheets shall be about 48 inches long with all cross seams staggered. The standing seams for both roofs shall be about 14" on center and 1" high, double locked. All sheets are to be fastened by cleats spaced not more than 12 inches apart. The sheets are to be fastened to the ridges by cleats not over 8" apart. These cleats shall be locked to the sheet and ridges shall be covered with a flashing cap locked over the

cleats and edges of sheets on both sides. All cross seams shall be tinned 1½" on contact side, locked and thoroughly sweated with solder. All nails used throughout the work shall be of best grade hard copper.

The finial on the tower roof shall be constructed of 16-oz. soft (roofing temper) copper accurately bent to the profiles shown on the detailed drawing and reinforced with straps and angles as required. All joints and seams shall be interlocked and soldered, reinforced on the back and made watertight.

VENTILATORS

Ventilators of size indicated on drawings shall be installed on roofs where shown. These shall be made of 18-gauge galvanized iron thoroughly braced, and shall be firmly and rigidly secured in place. Joints, angles and mitres shall be neatly made, well-riveted and soldered.

The ventilators shall in all respects be equal to the "Star" Ventilator.

Ventilators shall have 3"x3"x¼" angles all around the shaft to act as a bearing. This collar shall be thoroughly riveted to shaft and shall be set to the pitch of the roof so that shaft will be plumb. Shaft shall extend down into roof space about 24 inches and shall be long enough so that a pivot damper can be freely turned in same.

On the extreme bottoms of all ventilator shafts provide as detailed on sheet No. 7, 2"x2"x$\frac{5}{16}$" angle frames bent to true circles with rivets coun-

tersunk on the inside to permit free movement of dampers. Provide and set, six 8" Star ventilators on the roof, and connect through the attic with the flues from range in Room No. 18, fireplace in Room No. 118, heater in Room No. 2, toilets of Rooms No. 218 and 115, and heater in Room No. 9.

Provide two 12" Star Ventilators on Auditorium Roof.

All the small ventilators noted above shall be made of No. 24 and No. 26 galvanized iron.

GUTTERS AND DOWN PIPES

Provide and set the moulded gutter along the edge of the copper roof over the Corridor as detailed on sheet No. 15. Material shall be 16-oz. hard (cornice temper) copper. Provide the 4"x 2½" corrugated copper leader from the moulded gutter to a point 6" above the Auditorium roof. Provide the two, 3" copper pipes from the main tower roof as detailed on sheet No. 15. Intake of same to be well flashed.

FIRE DOORS

All doors and their frames of basement marked T. D. shall be Ohio standard tinned fire doors, bearing underwriter's label. The doors and frames so noted shall be covered with metal on one side only. All tinned fire doors and frames shall be furnished by this Contractor.

COMPOSITION ROOFS

Cover all roofs, except those already specified and the Auditorium roof, with a five-ply composition roof, put on in strict accordance with Barrett specifications. Material for these roofs shall be specification pitch and specification felt or their equal, and clean-screened, birds-eye gravel or penetrating coat, subject to the approval of the Director of Schools.

AUDITORIUM ROOF

The wood roof sheathing of the Auditorium roof shall be covered with Barrett's S. I. S. and asphalt roofing put on in strict accordance with Barrett specifications. The gutters and saddles shall be a 4-ply asphalt roof extending at least eighteen inches (18") up the slope of the roof and well bonded with the S. I. S. roofing of the major part of the roof. The S. I. S. roofing shall be that having the green-colored surface.

GUARANTEE

The Contractor will be required to give a written guarantee, warranting the sheet metal work and roofing, weather-proof, and any defect arising during the term of the guarantee shall be repaired by the Contractor at his own expense.

Sheet metal work shall be guaranteed for a term of two years and roofs for a term of ten years from the date of the final certificate.

CARPENTER WORK

(Read General Instructions)

WORK INCLUDED

Under this head is included all material and labor necessary for the satisfactory completion of the carpenter work as shown on the Plans or herein described, including the setting of all hardware, all cuting and fitting of woodwork for other Contractors engaged upon the work, together with the furnishing of all common nails, bolts, screws, etc., used in connection with the carpenter work.

Install metal grilles, provided by the Ornamental Iron Contractor, in all doors so marked.

Provide and set all wood templates, patterns, wood lintels, etc., to all openings and other places that may be required.

Provide strong wood centers carefully made, and set same securely in positions for turning all arches in exterior and interior walls. Strike and remove same when directed.

Provide and set in place temporary wood frames covered with strong heavy muslin to all exterior openings, for enclosing building during cold weather. Contractor may use old glazed sash for this purpose, if he so desires, but sash must be arranged so they can be taken out and put back for ventilation while the building is drying out.

Provide and set temporary doors with hinges and locks, boarding and temporary sash (glazed) after

building is enclosed, to enable workmen to execute this work during cold weather.

Do any and all cutting away and making good before and after the other craftsmen employed on the building, in connection with the carpentry work.

The Carpenter Contractor shall, on completion of the building, or when directed by the Director of Schools, scrub all floors clean throughout the building and shall wash and polish all glass of windows and doors.

WORK NOT INCLUDED

Forms and centering for concrete work are not included under this head.

MATERIALS

All nailing strips for wood floors shall be white oak chestnut or cypress.

All wood flooring shall be of the best quality clear maple flooring, thirteen-sixteenths by two and one-half inches (13/16"x2½"), shall have face practically free of all defects; standard lengths in this grade shall be trimmed to two to sixteen feet. The proportion of short lengths from two to three and one-half feet shall not be greater thanfif teen per cent.

All exterior door frames shall be made of sound, small red knotted dry white pine or California white pine, free from shake or sap.

All interior finish except where otherwise specified shall be of clear kiln-dryed Georgia pine.

SLEEPERS

Provide and set under all wooden floors, white oak,

chestnut or cypress sleepers, 2″x3″ beveled, and set 16″ on centers. Sleepers used in basement shall be given a good coat of hot coal tar pitch, or creosote, before being set. All sleepers shall be set to the proper level, properly leveled on top and properly secured in place so the placing of the concrete fill will not change their position.

WOOD CURBS

Provide and set wood curbs at all scuttle openings. The curb of scuttle in roof shall be 2 inches thick and shall project twelve inches above top of roof.

FRAMING FOR STAGE

The floor of the stage and dressing rooms will be of wood construction, built up from the concrete floor slab; joists shall be 2″x6″ S. P., set 16 inches on centers, and shall be cross-bridged, with one double row of herring bone cross-bridging, 2″x2″, nailed at each end with two 8d nails.

Build up from concrete slab as necessary, with 2″x4″ S. P., to support above joists as detailed.

FLOOR IN AUDITORIUM BALCONY

The floor in the balcony shall be built up on 2″ stuff, at 16″ centers, securely nailed to 2″x4″ sleepers. Cover the treads with seven-eighths by six-inch (⅞″x6″) matched and surfaced hemlock or No. 4 N. C. pine flooring.

ROOF SHEATHING

The roof of the Auditorium shall be covered with 2″x6″, No. 1 Yellow Pine D. & M. roof sheathing. The size given is commercial, but the

finish dimension shall not vary more than ⅜" either way. The sheathing must be of such length as will extend over at least two spans, joining over the purlins with joints staggered. The sheathing shall be surfaced on top and shall be securely nailed to the 2"x4" nailing strips which are bolted to the roof purlins. Note the saddles at walls and pitch of roof to roof sumps.

The roofs of the main tower and corridor at Auditorium side of main tower shall be covered with ⅞"x6" No. 1 Yellow Pine D. and M. roof sheathing. The sheathing shall be of thoroughly seasoned lumber, laid close and well nailed, nails set. All uneven edges of the boards shall be smoothed off to give a firm even surface.

The 2"x6" rafters of the main tower roof shall be well braced by the collar beams to which shall be nailed the ⅞" V cut ceiling. Note that the rafters up to the height of the collar beams are notched so as to receive the ⅞" V cut ceiling beneath the roof sheathing.

The ridges of the roof shall be of the shape and size detailed on sheet No. 15. They shall be well secured, truly lined and evenly placed with all nails set.

PLATFORM IN LIBRARY

The floor of the platform in the library at the entrance doorway shall be of wood construction built up from the concrete floor slab. The joists shall be 2"x6" S. P. set 16 inches on centers and

supported on 2"x4" securely nailed to the 2"x4" sleepers.

WOOD BUCKS

At all door and cased openings in 5" tile walls set 2¾"x5" dry S. P., bucks thoroughly secured in place; top members shall extend about four inches beyond sides and shall be built in the masonry.

Place 2"x4" wood bucks all around in all heat and vent openings and where metal heat or vent pipes pass through partitions and secure same thoroughly in place. These bucks shall form openings ¼" larger each way than the size marked on the drawings.

SUB-FLOORS AND SHEATHING

Cover the wood joists of stage, balcony and dressing rooms of same and the platform in library, with seven-eighths (⅞) matched and surfaced No. 4 N. C. pine flooring laid diagonally and weli-driven up and blind and face nailed to each bearing; joints made only over bearing. Sub floors shall be kept ½" away from walls.

SCUTTLE

Provide and set the cover of the scuttle in roof; same shall be provided with steel hooks and eyes; cover will be covered with metal by the Sheet Metal Contractor.

GROUNDS

Provide and set beveled grounds of dry surfaced material, ½" thick for masonry walls, except at jambs; at jambs and for lathed work they shall be ¾" thick.

Grounds shall be set straight, plumb and true for

all wood finish of whatever kind and for all blackboards.

There will be one row of grounds for blackboards and tack board, two rows for all wood base, one row for picture mould, two vertical rows for all interior doors, windows and transoms in masonry walls. There will be a ground all around all openings in plastered walls where heat and vent pipes pass through.

Note: The grounds around all window openings in exterior walls.

All grounds on masonry walls shall be secured to approved fixing brick; same will be set by the Mason. The carpenter shall direct the mason where to set the plugs and see that they are put in. The plugging of walls with wood will not be permitted.

Provide and set any other rough lumber that is evidently necessary to make a complete job of the whole work, whether specially mentioned or not.

FLOOR PAPERING

Provide and lay on the sleepers under all wood floors one thickness of waterproofed rawhide building paper, of approved brand, weighing not less than 50-lbs. per roll of 500 sq. feet, and one thickness of 2-lb. deadening felt of approved brand; felt neatly butted and laid flat.

DOOR AND WINDOW FRAMES

EXTERIOR DOOR FRAMES

All exterior door frames shall be made of sound small red knotted, dry white pine, or California white pine, free from shake or sap; all frames shall be properly smoothed up to show no plane or tool marks and all put together and set as called for by the detail drawings.

The frames for the main entrances shall be as detailed, with heavy molded jambs and mullions, molded and paneled transom bar and transom mullions. Frames shall be built up as shown, rabbeted for 2¼″ doors to swing out, and shall have 2″x2″ wind breaks, and iron dowels at bottom, sash in transom stopped in.

All that portion of the above frames exposed to view from the inside shall be of clear, kiln-dried Georgia pine.

INTERIOR DOOR FRAMES

The material for all interior door frames shall be clear kiln-dried Georgia pine free from any defects of whatever kind.

Frames of the openings into Auditorium shall be of 2″x6″ stuff, and shall have transoms frames ploughed for stops for 1¾″ doors to swing out. Sash of transoms stopped in. Place a ⅞″ quarter round at junction with plaster for a scribing mold.

Frames for the openings into the Auditorium balcony shall be as above without transoms.

Frames of the full T. D. doors of basement will

be furnished by Sheet Metal Contractor.

Frames for the Kalamein doors of Basement shall be of an approved make and the size shall be as specified for other interior doors.

Frames for the doors at the bottom of the Fresh Air Shaft shall be 1¾"x5½", rabbetted ½" deep for 1⅛" batten doors.

Frames of all other doors except those in 6 inch partitions shall be 1¾"x5¾", ploughed for stops for 1¾" doors, and shall have a ⅞" quarter round at junction with plaster; quarter round coped to top of base. Note that doors that swing out into corridors have frames set flush with plaster on corridor side, and joints between frames and plaster are covered with a ⅞" half round.

All doors marked T shall have transoms as detailed.

Frames for entrance doors of Room No. 118 shall be 1¾"x5¾". Frames ploughed for stops for 1¾" doors to swing out. Frames secured at bottom with iron dowels. Place ⅞" quarter round at angle with plaster and carry across top.

Frames of all doors in 5-inch partitions shall be 1⅛" by thickness of wall, ploughed for stops for 1¾" doors.

Frames of openings marked C. O. shall be ⅞" by thickness of wall.

Frames of all scuttles in ceiling, shall be ⅞" stuff and shall project 3" above ceiling slabs.

All interior frames mentioned above shall be

hand-smoothed, all moldings cleaned out, and left in perfect condition for the painter.

INTERIOR WINDOW FRAMES

All interior window frames shall be made of clear, kiln-dried Southern pine. Those of 5-inch partitions shall be ⅞" by the thickness of the jamb. Those of other walls shall be 1¾"x5¾" with stops both sides of sash. Frame shall have ⅞" quarter round both sides.

SASH

All interior sash unless otherwise noted shall be of clear, kiln-dried white pine, divided for glass as shown.

All sash shall be 1¾" thick.

Sash of interior door transoms and windows shall be stopped in with wood.

All sash shall be made in accordance with the details, and shall be mortised and tenoned, wedged and glued, and shall be hand-smoothed and fitted for hardware.

Sash of all exterior windows will be of steel, provided and set by other contractors.

DOORS

All doors (except those at the bottom of the fresh air shaft) shall be made with solid rails, stiles and panels.

All doors shall be blind tenoned and shall be put together in the best possible manner.

Entrance doors shall be made entirely of clear white pine. All others shall have white pine stiles and rails and Georgia pine panels.

Entrance doors shall be two and one-fourth inches (2¼") thick, all other doors shall be one and three-fourths inches (1¾") thick and all doors marked "G" shall have glass panels, glass stopped in with wood.

Kalamein doors of basement shall be of the best quality of an approved make and shall bear the Underwriter's label. The doors shall be of the types detailed on the plans and glazed where so indicated. All doors shall be given one priming coat before leaving the factory .

Doors marked T. D. will be furnished by the Sheet Metal Contractor and shall bear Underwriter's label. Doors of all cupboards and wardrobes shall be 1⅛" thick with ogee molded wood panels, or glass, as indicated.

Material for all doors shall be clear kiln-dried stock, and all doors shall be hand-smoothed with all moldings cleaned out.

All doors so indicated shall be glazed as shown, glass divided with muntins as indicated, muntins ¾" between glass. Muntins of cupboard doors shall be ½" between glass. Glass in doors of cupboards of Room No. 118 shall be stopped in with wood.

Doors to vent spaces back of toilets in rooms Nos. 3, 10, 103, 110, 203 and 210 shall be rabbeted over the slate jambs. Provide and set on the inside of these doors a strip of heavy rubber and canvas all as detailed on sheet No. 29.

Doors at bottom of fresh air shaft shall be 1⅛" baten doors well braced and made from well-seasoned clear Yellow Pine.

FLOORING

Cover all floors except where noted as concrete, marble, or tile, with thirteen-sixteenths by two and one-half inches (13/16x2½") tongued and grooved clear maple as defined in the latest revised rules of the Maple Manufacturers' Association, and as hereinbefore noted under "Materials." Butt joints shall be made only over bearings and shall be tongued and grooved. All flooring shall be well-seasoned and thoroughly kiln-dried, and shall not be laid until after the plastering has been completed and all other finish is in place. All flooring shall be bored for nailing and shall be tightly driven up and blind nailed at each bearing.

Where floors are fitted against walls, proper allowance for swelling shall be made. On completion of the floors, all uneven joints shall be dressed smooth and sand-papered.

All floors shall be leveled up as necessary with shimming strips not over sixteen-inch (16") centers well tacked in place. All flooring shall be nailed with cut nails, and floors shall be protected with papers as directed.

INTERIOR FINISH

Provide and set all interior finish; same shall be, unless otherwise specified, of clear, kiln-dried Georgia pine, and shall be put together and up in the best joiner work.

CASINGS

Doors, windows and cased openings in 5-inch partitions shall have 7/8"x4½" casings with both edges rounded. Windows in these partitions shall have 1⅛" stools with nosing with mold under.

Casings of all entrance doors shall be as detailed, with the frames.

All exterior windows except those of the Boiler Room, Coal Room, Engine and Pump Rooms, Main Tower, Shower Rooms, small window of Auditorium, Gymnasium and Main Toilets shall have 1⅛" stools with nosing with mold under and shall also have 1½"x1½" stop all around openings.

Case about the scuttles in ceilings with 7/8"x3" stuff. All above scuttles shall have covers.

WOOD BASE

Provide and set a wood base in all rooms and corridors that have wood floors.

This base shall be 7/8" x 6" for corridors and for rooms, and shall have top rounded, and a 7/8" quarter round at the floor. Base for Kindergarten shall be as above, but 7/8"x8". All of the above bases shall be rounded to fit all corners by turning out blocks to the proper radius and quartering same.

These blocks and the base joining same shall have

saw cuts in edges the full height of the base and shall have a metal spline driven in. The above 7/8" quarter round floor mold shall be nailed to floor, not nailed to base anywhere. Floor mold shall be carried around corners into jambs with proper radius.

BLACKBOARDS

All blackboards will be furnished and erected by the Board of Education, but all grounds and trim, including chalk rail and loose stop mold, shall be provided and put in place by this Contractor.

All blackboards, except those of basement, shall have tack boards over them as detailed. These tack boards shall be built up of approved cork carpet one-quarter inch in thickness securely glued to compo-board and cut to fit the spaces and shall be divided into panels about eight feet (8' 0") long, of approved color. All provided by the Carpenter Contractor.

Bottoms of blackboards in basement rooms shall be 3' 6" above floor, elsewhere as indicated.

Provide and erect the cork boards in Rooms Nos. 9, 18, 20, 118, and the first floor corridor. Same shall have blackboard borders all around, no chalk rail and shall be Tack Boards as above.

Provide and set the Tack Board in Room No. 118 as above, except color shall be brown, with blackboard border, without chalk rail. Bottom of Tack Board 2' 4" and top 7' 0" above floor.

Tack boards of basement shall be 3' 0" long by 3' 0" high set at level of blackboards.. Tack boards of corridors shall be 4' 0"x4' 0".

PICTURE MOLD

Provide and set seven-eighths by one and three-

fourths inch (⅞"x1¾") approved picture mold in Rooms Nos. 1, 2, 7, 9, 17, 18, 19 and 20, and in all corridors and rooms of first and second floors except cloak rooms, closets and Auditorium.

BASKET BALL BACKS

Provide and install the wood basket ball backs in Room No. 12; same shall be made as per the detail, of clear, kiln-dried white oak. Backs shall be made of ⅞" matched and surfaced stuff well driven up and screwed to frames of 1⅛" stuff. The frames shall be chamfered. Backs shall be secured to the walls or beam with expansion bolts and pipe supports as shown, all by this Contractor.

MANTEL SHELF

Provide and set the shelf over the fireplace of Room No. 118, shelf shall be veneered on a built up core, and shall be 2¼" thick. Shelf shall be built into the brick work and supported on molded brackets. Provide and set the bed mold, and the small quarter round on top.

HOOK STRIPS

Each coat room shall be provided with two hook strips, ⅞"x4", extending all around the room, and neatly chamfered. The lower row shall be 3' 6" and upper row 4' 6" above the floor in the basement and first story, and 4'0" and 5'0" above the floor in second story. For cloak room of Room No. 118 strips shall be 3' 0" and 4' 0" above floor.

Place one hook strip as above all around closets of Rooms Nos. 114, 115 and 218.

Provide one hook strip 6′ 0″ long, 5′ 6″ above floor in all janitors' closets.

CLOSET SHELVES

Provide and set all the shelves in closets, storerooms and stock rooms as indicated or specified.

Each janitor's closet on first and second floors shall have 12″ shelves on neat chamfered cleats.

Store Rooms No. 19A and the first and second floors and lumber room No. 8 shall have shelves as detailed on Sheet No. 29. These shelves shall be backed up with $\frac{7}{16}$″ stuff, put on vertically, well driven up and blind nailed.

CUPBOARDS

Build and set all the cupboards and wardrobes shown, all as detailed on Sheet No. 29. All shall be lined all over inside with $\frac{7}{16}$″ matched Georgia pine put on vertically, well driven up and blind nailed.

Cupboards of cloak rooms shall have drawers in lower sections, upper section divided into two parts. One part shall have one fixed shelf, other part one fixed shelf and three movable shelves. Fronts and counter-shelves shall be 1⅛″ thick, shelving ⅞″

The cupboard in Room No. 18 shall have lower cupboards with one row of drawers and counter-shelf over, then a 14″ space with upper cupboards over.

The lower cupboards shall have one fixed shelf, the drawers over shall be five inches deep inside and shall project two inches beyond the face of lower cupboards.

Counter-shelf shall be set 2'9" above the floor, shall be 1⅛" thick and 2'3" wide, front shall have nosing with small mold under. The upper cupboard shall set 14" above counter-shelf, with three adjustable shelves. The back of the space between counter-shelf and upper cupboard shall be filled with ⅞" board with a ⅜" quarter round in all horizontal and vertical angles.

Counter-shelf shall be of clear, kiln-dried yellow poplar.

The cupboards in Rooms Nos. 8, 9, 18, 19, and 20 shall be as above, but constructed to the details shown on Sheet No. 29.

The cupboards in Room No. 118 shall be as shown by the detail with $\frac{7}{16}$" matched backs, 1⅛" fronts, and doors, cornice, mold, base, and three movable ⅞" shelves. Free ends of cupboards shall be paneled. Doors shall be divided for glass as shown with muntins ½" between glass, which shall be stopped in with wood.

The two cupboards for Room No. 119 shall be as detailed on Sheet No. 29.

Movable shelves of all the above cupboards shall be supported on metal shelf plugs, bored and countersunk or nickel-plated ratchets, provided and set by this Contractor.

All drawers shall be housed together and shall be free running.

STAGE FRONT

Build the front of the stage as detailed of ⅞"

and 1⅛" stuff with heavy mold at level of stage floors. Steps to stage shall have ⅞" G. P. risers and 1⅛" edge grained G. P. treads with nosing and cove, risers and treads housed into strings. Steps shown in Rooms Nos. 1, 112A and 112B shall be as above, and as detailed on Sheet No. 29.

LUMBER RACK

Provide and install the wood platform for lumber rack in Room No. 8 all as shown by detail on Sheet No. 29.

BALCONY AND STAIR RAILS

Provide and set on top of the Auditorium balcony girder, a 1¾"x11¾" white oak molded as per future detail and secure to girder with tap screws, space not over 24" apart and staggered. Tap screws let into top of wood and holes plugged with wood. The wood hand rails of stairs shall be of oak, 2½" diameter.

OTHER WORK

Provide and secure to the seat supports in the Gymnasium the 1⅝"x11½" clear Yellow Pine seat boards all as detailed on Sheet No. 27.

Provide and set any other wood finish evidently required to complete the work, whether specifically mentioned or not.

WORKMANSHIP

All interior finish shall be best joiner work, nails well set with a finishing set, and shall be hand-smoothed and left smooth and ready for the painter.

CLEATS

Provide and set chamfered cleats as necessary for the plumber to attach his fixtures.

CUTTING AND REPAIRING

Do all cutting for the plumber, gas fitter and heating contractor and repair and make good after all contractors.

GLASS AND GLAZING

(Read General Conditions)

WORK INCLUDED

Under this head is included all material and labor necessary for the complete installation of all glass, shown on the plans and herein specified.

The glass of all windows, of toilets, the glass of windows of Rooms Nos. 6 and 14, shall be first quality, double strength, ribbed glass, ribs turned out and run vertical.

The windows of Room No. 12 shall be glazed with first quality maze wire glass ¼" thick. No wire smaller than No. 24, Brown and Sharpe gauge, shall be used. Sample shall be submitted to the Director of Schools for his approval.

All other glass (except that in Kalamein doors) shall be first quality AA double strength American sheet glass.

Glass in all doors (except that in Kalamein doors) shall be stopped in with wood by the Contractor. Glass in all wood sash shall be bedded, bradded, puttied and back puttied with pure linseed oil putty with an equal part of best white lead and oil.

The glass in the Kalamein doors shall be polished wire glass, ¼" thick, that will meet the Underwriter's Laboratory requirements.

Specifications for Labor and Material

Glass in all exterior windows will be set in steel sash with clips and putty. Glass shall be bedded, puttied and back puttied with putty equal in all respects to that recommended by the sash manufacturers.

All glass shall be left whole at the completion of the work. No sash shall be handled till the putty is hard, and any putty showing finger marks shall be taken off and replaced.

Note: The contractor can procure a schedule of the glass sizes for the steel sash from the manufacturer of same, but he shall recheck and be responsible for the correctness of the schedule.

PAINTING AND FINISHING

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor and material necessary for the satisfactory completion of the painting as hereinafter mentioned. The painting of all exterior sheet metal, and iron and steel work is included. The painting of all interior iron and steel work, and all sheet metal ducts, diffusers and sheet metal curves at top and bottom of all hot and foul air ducts is included. The painting of the outside of all wash bowls, sinks, drinking fountains and the range boiler and standards, and all exposed plumbing pipes, except as hereinafter noted, is included. The painting of all exposed heating pipes, except in Rooms Nos. 4, 5, 15 and 16, and the plenum chambers, is included. The painting of all pipe covering, both heating and plumbing, except in Rooms 4, 5, 15 and 16, and in the plenum chambers, is included. The painting of the pipe covering on plumbing pipes in rooms, excepted above, is included.

The painting of direct radiation is included.

WORK NOT INCLUDED

The painting of all heating pipes and the covering of same, in Rooms 4, 5, 15 and 16, and in the plenum chambers, and the metal work of boilers, engines, pumps and fans is not included under this head.

Specifications for Labor and Material

GENERAL

The Contractor for the painting shall:

Provide at his own cost all tools, scaffolding, transportation, labor and materials of the best quality and in sufficient quantities as required to complete the "Painting and Finishing" promptly and to the satisfaction of the Director of Schools.

Protect and be responsible for his own work until the completion of the building, and shall replace and make good at his own cost any and all work and material damaged from any cause whatever. He shall be responsible and pay for any damage caused by himself or workmen to adjoining work.

Paint the backs of all wood window and door frames and bottoms of sills of same and the back of all wood finish one good coat. The material for this work shall be linseed oil paint of such quality and kind as to thoroughly stop the pores.

OUTSIDE PAINTING

Paint all the exterior wood and metal work, except copper, three good coats.

The frames of the entrances, and the exterior of doors of same shall be painted a dark bottle green of approved shade.

The flagpole shall be painted as above, white.

The screens over fresh air intakes shall be painted a dark green color.

Color for all window guards shall be selected.

The exterior of all steel sash and frames shall be painted white.

Note: The priming coat of steel sash and frames and Kalamein doors will be put on by the

manufacturer before same are delivered, but will not be considered as a coat under these specifications.

All work shall be primed as soon as set, or before, whenever practicable. All knots and pitchy spots must be shellaced with pure grain alcohol shellac before painting is done. No painting shall be done while work is at all damp, and no painting shall be done in frosty weather. All nail holes and checks shall be puttied up with the best putty mixed with 50 per cent pure white lead ground in oil, after priming. All workmanship shall be first class. All outside painting shall be of two coats full gloss, third coat half gloss.

The material for all the above painting, except first coat on sheet metal, shall consist of best white lead, pure raw linseed oil, pure spirits of turpentine and pigments ground in pure linseed oil. The material for first coat on sheet metal shall be pure red lead and pure linseed oil.

INSIDE PAINTING

All white pine of painted work shall have a thin coat of pure grain alcohol shellac on the priming. All nail holes, checks and other imperfections shall be stopped with white lead putty after priming to match the color of finish, and putty sand papered. All work shall be primed as set and all work shall be surfaced, between coats, to a fine smooth surface for succeeding coats. All the painting shall be a thoroughly first-class job, only the best material being used. All paint shall be thoroughly strained

through cheese cloth. No laps or brush marks shall show anywhere. The upper and under edges of all sash and doors shall have at least two coats for painted work and elsewhere shall be stained and otherwise treated to match finish on the wood.

Paint all the woodwork of all lavatories and toilets and showers three good coats of Eagle white lead and linseed oil and one good coat of Vitralite gloss finish. The shellac on all white pine of doors of these rooms will not be considered as a coat.

All wood and metal work of Rooms Nos. 4, 5, 15 and 16, and ash storage room shall have two coats of paint.

Paint all Kalamein doors and trim to match the interior wood doors and trim.

All the interior Georgia pine finish in all rooms except those noted above and the exterior window stools, shall be stained as directed, and shall then have one coat of grain alcohol shellac ,and two coats of varnish, all surfaced between coats, last coat flatted.

The stools of exterior windows, except where painted, shall be stained as above, and shall have three coats of Spar varnish, surfaced between coats, last coat left full gloss.

The balcony rail and basket ball backs shall be filled with a silica filler, stained as directed, and shall be finished same as Georgia pine, using Spar Varnish.

The drawers of all cupboards shall be stained to match the interior finish and shall have one coat of shellac and one coat of varnish, surfaced between coats, last coat full gloss.

Paint all exposed iron work and the interior of all steel sash and frames, two good coats of lead and oil paint, colored as directed. The coat put on by the iron and steel Contractor shall not count as one of the above coats.

All wood floors throughout shall be thoroughly cleaned and shall then have two good coats of hot raw linseed oil, both coats shall have surplus wiped off and the first coat shall be allowed to thoroughly dry before the second coat is put on.

Countershelf of all cupboards in Room No. 18 shall be treated same as floors.

All slate work of all toilets, showers and stairs, shall be thoroughly cleaned, and shall have two good coats of lamp black and linseed oil well rubbed in and the surplus wiped off.

Paint the outside of all drinking fountains, sinks and lavatories, and iron brackets of same, the range boiler and standard, all galvanized iron work of the heating and ventilating system that is exposed to view, all register faces and grilles, the inside of all heat and vent ducts as far as can be seen from the room, and all plumbing pipes and covering of same, and all heating pipes and covering for same, except as before noted, three good coats of lead and oil paint.

Paint the direct radiation throughout the building, one coat of ochre and two coats of approved radiator enamel in color to be selected.

All concrete floors shall be thoroughly cleaned of all dust and dirt and shall have three good coats of

Lapidolith put on in strict accordance with the manufacturer's directions.

Paint all manhole doors, two good coats, colored as directed.

This Contractor shall letter on the manhole doors of the plenum chambers, as directed by the Heating Inspector, the letter of the plenum given on the plans and the numbers of the rooms heated from that chamber.

MATERIAL

All painting and finishing material shall be of the best quality of the kind specified and shall be delivered to the building in original package, properly stamped with the name of the maker, in quantities sufficient to complete the work.

All paint shall be made of pure white lead, pure linseed oil, pure spirits of turpentine, and color ground in pure linseed oil. All varnish shall be equal to one of the following grades: Mountain Varnish and Color Works, Stability Interior; Pratt & Lambert's No. 38 Preservative; Murphy & Co., transparent wood finish interior; Chicago Varnish Co.'s Shipoleum; Standard Varnish Co.'s Elastica No. 2; Flood & Conklin's Crystal Finish; Berry Bros. Luxeberry Wood Finish; Pitcairn's Spar Varnish, and shall be approved by the Director of Schools.

All Spar Varnish shall be equal to the best make of the same companies.

The painter shall leave no paint spots on glass, floors, wood-trimmings or walls; wherever any such occur he must remove them and must leave all his work in a finished condition in every respect.

Paint all tinned doors and their frames three good coats of paint.

DECORATION OF ROOM NO. 118

The Contractor for the painting shall treat Room No. 118 as follows: Cover all the plastered side walls from the base up to the cornice mold, with decorator's approved prepared canvas, put on in best possible manner, free from blisters, with joints neatly butted, but at corners and angles. This canvas shall have three coats of lead and oil paint, last two coats stippled, last coat flat. The color for this shall be a brownish tan, approved by the Director of Schools. Cover the walls above the cornice mold up to the picture mold with a plain oat-meal paper and on this paper apply a frieze of picture paper. Above paper will be provided by the Board of Education, but this contractor shall give the Director of Schools an estimate of the amount required, and shall also be responsible for the correctness of said amount. This estimate shall be given at least three weeks before the paper will be needed.

The sidewalls above the picture mold, and the ceiling shall be painted with Keystona, at least three coats, more if necessary to produce a perfectly clear tone. Keystona shall be a very light cream in color and shall be applied according to the directions of the manufacturers.

The plastered sidewalls and ceilings of the toilet and coat rooms of Room No. 118 shall be painted same as ceiling of room, but color to be selected by the Director of Schools.

HARDWARE

(Read General Conditions.)

WORK INCLUDED

Under this head is included the furnishing of all hardware necessary to fully complete the work, except such common bolts, screws, nails, etc., as are specified under other heads. Hardware for exterior windows not included in this contract.

SAMPLES

A full line of samples of the hardware herein described, shall be submitted to the Director of Schools for approval before same is delivered to the building.

SUBSTITUTION

The following schedule is made up from the catalogue of Russell & Erwin Mfg. Co. (except where noted), and is intended as a guide only; other makes of hardware may be substituted, provided they are equal in grade and similar in design to that of the schedule, and are approved by the Director of Schools.

The schedule is intended to be a complete list of all the builders' hardware required for the work, but it is distinctly understood that the Contractor shall check same and shall provide and set any other hardware required, without extra cost.

All cylinder locks shall be fitted with Yale & Towne cylinders; they shall all be keyed alike and fitted to pass the grand master key of the Board of

Education; twelve keys for the whole job. All bit key locks shall be keyed alike; one key for each lock.

All finish, unless otherwise noted, shall be R. & E. No. 9.

Butts for all exterior doors shall be cast bronze with loose ball-tipped pins and hardened steel bushings. Bushings shall extend the entire length of each knuckle. Butts shall weigh not less than two and one-fourth (2¼) pounds each.

All other butts are taken from Stanley catalogue.

Russwin Panic Bolts similar to the ones specified will be approved.

All door checks and springs shall be guaranteed for two years and shall be replaced free of charge should any defect arise during that period. They may be Rixon, Yale, Russwin or Norton.

BASEMENT

1 door, Room No. 4 from Room 5.

1 door, Room No. 5 from Ash Storage.

Sliding Tinned Doors.

Provide with Underwriters Trolley Track, ball bearing or roller hangers, stop and guides, counter-weight and fusible link and chain.

2 handles, 2232.

2 flush handles 2110.

1 door, Room No. 4 from Ejector Room.

3'-0"x7'-0"x1¾" Tinned Door.

1½ pairs strap hinges, 1306¼, 6" Stanley, bolted through door, screwed to frame.

1 door pull No. 2232.

1 spring and check, bolted to door, screwed to frame

1 door, Heater Room from Room No. 2.

3'-0"x7'-0"x1¾" door, Tinned One Side. 2¾" B. S.
1½ pairs butts, 241½F, 4½"x4½".
1 lock set 444¾x952x2376, Fin. 9. Enfield.
1 door holder No. 270, Fin. 9.
1 door stop No. 150½, Fin. 9.
1 door check and spring, screwed to door, screwed to frame.
1 Kalamein door, Corridor from Room No. 5.
1 Kalamein door, Corridor from Room No. 9.
1 Kalamein door, Corridor from Fresh Air Intake.
1 Kalamein door, Corridor from Room No. 16.
1 Kalamein door, Corridor from Room No. 18.
1 Kalamein door, Corridor from Room No. 20.
All 3'-0"x7'-0"x1¾" thick.
1 Kalamein door, Room No. 17 from Room No. 18.
1 Kalamein door, Room No. 7 from Room No. 8.
All 2'-8"x7'-0"x1¾" thick x 2¾" B.S.
12 pairs butts, 241½F, 4½"x4½".
12 lock set 444¾x952x2376, Enfield, Fin. 9.
12 door holders No. 270, Fin. 9.
10 door stops No. 151½, Fin. 9.
2 door stops No. 150½, Fin. 9.
12 door checks and springs, screwed to doors, screwed to frames.
1 door, Corridor from Room No. 1.
1 door, Corridor from Room No. 2.
1 door, Corridor from Room No. 7.
1 door, Corridor from Room No. 17.
1 door, Corridor from Store Room No. 19A.

For Harvard School Building

1 door, Corridor from Exhaust Fan Room.
1 door, Room No. 10 from Exhaust Fan Room.
1 door, Corridor from Janitor's Closet.
1 door, Room No. 15 from Room No. 15A.
1 door, Room No. 15A from Room No. 16.
1 door, Room No. 16 from Room No. 15.
All 1¾" thick x 2¾" B. S.
16½ pairs butts No. 241½F, 4½"x4½".
11 lock sets 444¾x952x2376 Enfield, Fin. 9.
11 door holders, No. 270, Fin. 9.
11 door stops, No. 151½, Fin. 9.
1 door, Corridor from Room No. 6.
1 door, Corridor from Room No. 14.
1 door, Room No. 6 from Room No. 6A.
1 door, Room No. 2 from Toilet.
All 1¾" thick x 2¾" B. S.
6 pairs butts No. 241½F, 4½"x4½".
4 lock sets 444¾x952x2376, Enfield, Fin. 9x, Fin. 4.
4 door holders No. 270, Fin. 4.
3 door stops No. 151½, Fin. 9.
1 door stop No. 150½, Fin. 9.
1 door, Room No. 18 from Room No. 19.
1¾" thick x 2¾" B. S.
1½ pair butts No. 241½F, 4½" x 4½".
1 latch set No. 025x990x2376, Enfield, Fin. 9.
1 door holder No. 270, Fin. 9.
1 door stop No. 150½, Fin. 9.
1 door, Room No. 19 from Room No. 20.
1¾" thick x 2¾" B. S.
1½ pair butts No. 241½F, 4½"x4½".
1 lock set 1384¾x952x2376, Enfield, Fin. 9.
1 door holder No. 270, Fin. 9.

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1 door stop No. 150½, Fin. 9.

2 pairs doors, Corridor from Room No. 12.

Doors 2′-8″ x 7′-0″ x 1¾″ thick, 2¾″ B. S.

6 pairs butts No. 241½F, 4½″x4½″.

2 lock sets, 444¾x952x2376, Enfield, Fin. 9.

3 Smith's Improved Panic bolts No. S-35 R. H. R. B. Fin. 9, with automatic dogging feature and special bottom strike to set flush in cement floor.

4 door holders No. 270, Fin. 9.

4 door stops No. 151½, Fin. 9.

1 door, to Toilet in Room No. 16.

Slate 1⅛″ thick, Door 1⅛″ thick.

1 pair spring hinges No. 346, Fin. 4.

1 strike, No. 8, Fin. 4.

1 bolt, No. 0158, Fin. 4.

3 pairs doors, bottom of Fresh Air Intake.

9 pairs strap hinges, 1306¼, 6″ Stanley, bolted through door, screwed to frame.

3 door pulls No. 2232.

3 door holdersNo. 270, Fin. 9.

MISCELLANEOUS

1 dozen coat and hat hooks, T-7147½, Fin. 9, in Janitor's closet.

CUPBOARD, ROOM NO. 9

22 pairs butts, 241½F, 3″x3″.

8 cupboard locks, cylinder locks for 1⅛″ fronts, seven keyed alike, that different for cupboard marked "A."

2 cupboard turns, No. 1125, Fin. 9.

10 cast iron elbow catches.

4 drawer locks, cylinder locks for 1⅛″ fronts, two keyed alike and like the seven cupboard locks above, the other two keyed alike and like the one

cupboard lock above for cupboard "A."

6 keys for nine locks.

3 keys for three locks.

4 pairs drawer pulls, No. T-7037, Fin. 9.

8 shutter knobs, No. 43, Fin. 9.

30 card holders, R. & E 1937¼, finish 9.

CUPBOARD, ROOM NO. 8

12 pairs butts, 241½F, 3"x3".

4 cupboard locks, cylinder locks for 1⅛" fronts, keyed alike in pairs.

4 cast iron elbow catches.

4 shutter knobs, No. 43, Fin. 9.

CUPBOARD ROOM NO. 18

21½" pair butts, 241½F, 3"x3".

9 cupboard locks, cylinder locks for 1⅛" doors, keyed alike.

8 cast iron elbow catches.

4 drawer locks, cylinder locks, for 1⅛" fronts, keyed alike and like cupboard locks above.

6 keys for above locks.

9 shutter knobs, No. 43, Fin. 9.

8 drawer pulls, No. T-7037, Fin. 9.

CUPBOARD, ROOM NO. 19

8 pairs butts, 241½F, 3"x3".

4 cupboard cylinder locks for 1⅛" doors, keyed like locks for cupboard in Room No. 18.

4 cast iron elbow catches.

2 drawer locks, cylinder locks for 1⅛" front, keyed like cupboard locks.

4 shutter knobs, No. 43, Fin. 9.

2 drawer pulls, No. T-7037, Fin. 9.

CUPBOARD, ROOM NO. 20

20 pairs butts, 241½F, 3″x3″.

10 cupboard locks, cylinder locks for 1⅛″ doors, 4 locks "A" keyed alike, 2 locks "B" keyed alike and 4 locks "C" keyed alike.

10 cast iron elbow catches.

3 pair drawer pulls, No. T-7037, Fin. 9.

4 drawer locks, cylinder locks for 1⅛″ fronts, 2 keyed alike, and like "A" locks above, one lock "B" like "B" locks above, and one lock "C" like "C" locks above.

6 keys for "A" locks.

6 keys for "C" locks.

3 keys for "B" locks.

10 shutter knobs, No. 43, Fin. 9.

FIRST FLOOR

7 pairs Entrance doors.
2′6″x7′-0″x2¼″, 6″ stiles.

1 pair Entrance doors
2′6″x7′-10″x2¼″, 6″ stiles.

24 pairs butts, E. A. 61½. (Corbin)

16 No. S-270 Smith's Improved self-releasing fire exit latches, ½ R. H. R. B. They shall be fitted with Y. & T. cylinders to pass the grand master key of the Board of Education, Toledo, Ohio. Escutcheons shall have eight screws each, knobs shall be of same character as standard knobs, but shall be oval instead of round.

16 kick plates, 8½″x29″, solid wrought brass, No. 14 gauge.

16 door checks and springs of proper size for the doors, with corner brackets, dead black finish.

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All Smith's equipment shall have the No. 9 finish, and shall have bottom strikes made to a special detail with brass expansion screws, and shields for securing to stone sills. Provide and set for the above doors, 8 combined door holders and bumpers, No. 143, R. H. Gardner & Co., Chicago, Ill.

4 combined door holders and bumpers, No. 142 as above

1 door, Corridor from Room No. 101.
1 door, Corridor from Room No. 102.
1 door, Corridor from Room No. 104.
1 door, Corridor from Room No. 105.
2 doors, Dressing Rooms from Stage.
1 door, Corridor from Room No. 107.
1 door, Corridor from Room No. 108.
1 door, Corridor from Room No. 109.
1 door, Corridor from Room No. 111.
2 doors, Corridor from Janitor's Closets.
1 door, Corridor from Room No. 116A.
1 door, Room No. 114 from Closet.
1 door, Corridor from Room No. 114.
1 door, Corridor from Room No. 112A.
1 door, Corridor from Room No. 112B.
1 door, Corridor from Room No. 115.
1 door, Room No. 115 from Closet.
1 door, Corridor from Room No. 116.
1 door, Corridor from Room No. 120.
1 door, Room No. 118 from Storage Room.
All 1¾" thick x 2¾" B. S.
33 pairs butts No. 241½F, 4½"x4½".
22 lock sets 444¾x952x2376, Fin. 9, Enfield.
22 door holders No. 270, Fin. 9.

22 door stops No. 150½, Fin. 9.
1 door, Room No. 115 from Toilet.
1 door, Room No. 114 from Toilet.
1 door, Room No. 11from Toilet.
1¾" thick x 2¾" B. S.
4½ pairs butts 241½, N. P. 4½"x4½".
3 lock sets 444¾x952x2376 Enfield, Fin. 9xFin. 4.
3 door holders No. 270, Fin. 4.
3 door stops No. 150½, Fin. 9.
3 pairs doors, Corridor from Room No. 112.
2'8"x7'-0"x1¾" thick. 2¾" B. S.
2 pairs doors, Corridor from Room No. 118.
2'-6"x7'-0"x1¾" thick. 2¾" B. S.
15 pairs butts No. 241½F, 4½"x4½".
5 lock sets 444¾x952x2376, Enfield, Fin. 9.
5 Smith's Improved Panic bolts No. S-35, R. H. R. B. Fin. 9, with special bottom strike to set flush in wood floor.
10 door holders No. 270, Fin. 9.
10 door stops No. 150½, Fin. 9.

CUPBOARD, ROOM NO. 118

48 pairs butts, 241½F, 3"x3".
4 cupboard locks, cylinder locks for 1⅛" doors, one-half (½) keyed alike, 3 keys for each change.
4 shutter knobs, No. 43, Fin. 9.
16 elbow catches.
12 cupboard turns, No. 1125, Fin. 9.

10 COAT ROOM CUPBOARDS

60 pairs butts No. 241½, 3"x3".
20 cupboard turns No. 1125, Fin. 9.
20 elbow catches.
20 drawer pulls No. T-7037, Fin. 9.
4 dozen coat and hat hooks, T-7147½, Fin. 9.

For Harvard School Building

MISCELLANEOUS

40½ doz. coat and hat hooks, T 7147½, Fin. 9.

SECOND FLOOR

1 door, Corridor from Room No. 201.
1 door, Corridor from Room No. 202.
1 door, Corridor from Room 204.
1 door, Corridor from Store Room.
1 door, Corridor from Room No. 205.
1 door, Corridor from Room No. 207.
1 door, Corridor from Room No. 208.
1 door, Corridor from Room No. 209.
1 door, Corridor from Room No. 212.
1 door, Corridor from Room No. 214.
2 doors, Corridor from Janitor's Closets
1 door, Corridor from Room No. 216.
1 door, Room No. 218 from Closet.
1 door, Corridor from Room No. 217.
1 door, Corridor from Room No. 218.
1 door, Corridor from Room No. 219.
1 door, Corridor from Room No. 220.

All 1¾" thick x 2¾" B. S.

27 pairs butts, No. 241½F, 4½"x4½".
18 lock sets 444¾x952x2376, Enfield, Fin. 9.
18 door holders No. 270, Fin. 9.
18 door stops No. 150½, Fin. 9.
1 door, Room No. 214 from Toilet.
1 door, Room No. 218 from Toilet.

1¾" thick x 2¾" B. S.

3 pairs butts No. 241½F, 4½"x4½".
2 lock sets 444¾x952x2376, Enfield, Fin. 9 x Fin. 4.
2 door holders No. 270, Fin. 4.
2 door stops No. 150½, Fin. 9.

2 pairs doors, Corridor from Balcony No. 112, each door 2'-6"x7'-8", 1¾" thick, 2¾" B. S.

6 pairs butts No. 241½F, 4½"x4½".

2 lock sets 444¾x952x2376, Enfield, Fin. 9.

2 Smith's Improved Panic bolts No. S-35, R. H. R. B. Fin. 9, with special strikes to set flush in woodfloor.

4 door holders No. 270, Fin. 9.

4 door stops No. 150½, Fin. 9.

11 COAT ROOM CUPBOARDS

66 pairs butts 241½F., 3"x3".

22 cupboard turns No. 1125, Fin. 9.

22 elbow catches.

22 drawer pulls, No. T-7037, Fin. 9.

5 dozen coat and hat hooks, T-7147½, Fin. 9.

MISCELLANEOUS

45 dozen coat and hat hooks, T-714½, Fin. 9.

In addition to the above, the Contractor for the hardware shall provide for the whole job, Ives or equal stop bead adjusters for all stops not ploughed in; same shall be not over 2' 0" apart, staggered for stops 2" or over in width, and shall be finished old or dull brass.

FITTING HARDWARE

All hardware shall be perfectly fitted in place in a neat, workmanlike manner. After fitting, hardware shall be removed to allow for the painting of woodwork and shall be replaced when directed.

STEEL SASH AND FRAMES

WORK INCLUDED

Under this head is included all labor and material necessary for the manufacture and erection of all exterior sash and their frames (except transoms over entrance doors), for the entire buildings.

WORK NOT INCLUDED

The glass and glazing is not included under this head.

BIDS

Parties bidding for the steel sash, casements and frames shall make their bids directly to the Board of Education, Toledo, Ohio, who will examine all bids and make the selection in accordance with the last paragraph under heading entitled "Notice to Contractor", included in the introduction to these Specifications.

The amount and conditions of the bid will be turned over to the party or parties to whom the General Contract is awarded and he or they will be required to enter into a contract with the sash manufacturer whose bid is selected. The sash manufacturer will be required to meet the required conditions of the General Contractor as to time of delivery, and will be required to execute the form of contract and bond shown in these specifications and the Sash Contractor will also be required to pay their proportionate share of the contract bond. It shall be distinctly understood that the Board of Education acts as the General Contractor's agent for the purpose

of securing bids and making a selection only, and their responsibility ceases at the time the amount of the bid and the selection is made known to him.

SAMPLES

Each party tendering a bid for the steel sash, casements and frames shall make and deliver a sample of same at least two days before the date set for receiving bids. Sample shall be delivered at the Administration Building of the Board of Education, who will unpack same, but samples shall be re-crated and removed by the party submitting them.

The sample shall consist of the section of a typical class room window with sill and mullion and shall be trimmed with all hardware necessary for its successful operation, and with one glass opening glazed. The Board of Education will be governed in its selection by the design, quality and workmanship of the sample submitted, in connection with the price stated in the bid.

Samples of the unsuccessful bidders shall be removed after the award of the contract; the samples of the successful bidder will be retained by the Board of Education till the completion of the contract.

DRAWINGS

The details (see sheet No. 24), show sash and frame of Truscon Concrete Steel Co.'s construction, but are to be considered as establishing a standard only, other designs showing sash and frames of equal quality will be considered, but same must be made to fit the openings as shown on the drawings, without increasing size of glass.

SASH AND FRAMES

All sash and frames shall be built up of heavy solid rolled-steel shapes, and shall have mullions, transom bars and muntins as indicated. All sash shall be for putty glazing and this Contractor shall furnish all clips for same. Sash indicated by the dotted diagonal lines and the corresponding sash in that portion of elevation not shown finished on the drawings, shall be counter-balanced, sash not so shown shall be stationary, but made to correspond in appearance with counter-balanced sash.

Note: The hinged windows of Room No. 4. The hinged windows shall be equipped with bronze butts cylinder lock sets.

The locks shall be keyed the same as other cylinder locks in the building, and keyed to the grand master key of the Board of Education.

The counter-balanced sash shall be provided with approved malleable hardware, approved pulleys, bronze sash chain of correct size for the sash it carries and copper weather strips. All sash above the basement shall be equipped with life belt hooks.

All hardware shall be properly fitted and secured.

All the above sash and frames shall be properly designed for structural strength and wind pressure. They shall be squared and made true to a plane, and shall be guaranteed weather-tight by the manufacturers.

All sash and casements shall have joints properly fitted and welded.

All the above work shall be painted one good coat

at the factory.

This Contractor shall at the request of the General Contractor furnish him a complete schedule of glass sizes, without, however, assuming any responsibility for its correctness. He shall also provide the Contractor with all necessary information he may require for setting the work properly.

GENERAL

The entire work shall be executed in a neat and workmanlike manner, and as detailed, or specified, and if the exact method is not specifically mentioned in the specifications or detailed on the plans, then it shall be done as the Director of Schools may direct.

For Harvard School Building

HEATING AND VENTILATING

(Read General Conditions)

DESCRIPTION OF SYSTEM

Heating will be accomplished by means of steam circulated at about atmospheric pressure. There will be tempering heaters placed as closely as possible to the cold air intake, and there will be reheaters placed at the bases of the various flues which lead to the rooms, the whole arrangement being such that when the fans are stopped, the whole building will still be warmed to some extent by gravity. Direct radiators will be placed in offices, toilets, corridors and similar rooms.

The machinery, except the Auditorium supply fan and exhaust fans, will be steam operated, so that the building may be independent of electric supply for heating, while the exhaust fans will be electrically operated so as to give ventilation when the heating plant is not needed. The working pressure on the boilers will be not to exceed 35 pounds.

GENERAL CONDITIONS

The general conditions of the architect's specifications, giving instructions and information relating to requirements, time of completion, alterations, permits, contract and bond, payments, drawings, etc., are hereby made a part of this specification, and contractors are required to acquaint themselves with these general conditions, which will be made a part of the contract.

Where no special quality of material or labor is mentioned, it is understood that the quality of materials and labor shall correspond with that called

for in the architect's specifications for similar work.

WORK INCLUDED

All instructions in these specifications such as "do," "provide," "furnish," "build" and the like shall be read and understood as directions given to the contractor. All labor and material necessary for the completion and installation of the heating and ventilating system is included.

WORK NOT INCLUDED:

Other contractors will:

Leave tees in the pump room near the receiving tank for hot and cold water connections, which will be continued from this point by the contractor.

Connect flow service and return connections to the hot water heating tank furnished by the contractor.

Connect from the sewer to the blowoff tank furnished and set by the contractor.

Make 1″ water supply, 2″ overflow and 1¼″ drain connections with valves to the pan humidifier located in the fan room.

Furnish and erect various floor drains and traps near the boiler fronts, near the pumps, near the engine, etc.

Furnish and erect such grilles or louvers as are marked to go in doors.

Build the reheater enclosures where of masonry.

Furnish and erect the roof ventilators.

BOND

Bond shall be furnished by an approved surety company in the amount of 50% of the contract price, and shall be furnished when the contract is signed. It shall cover all of the provisions of the

guarantee clause, as well as the standard provisions of the contract. It shall cover the entire time of execution of the contract, and shall terminate only upon the completion and acceptance of the contract as a whole.

LIABILITY INSURANCE

The contractor shall carry approved insurance protecting himself as well as the owner against damage caused by accident in or to the building, and against liability for injury to persons during construction and until the final acceptance of the work.

GUARANTEE

The contractor shall make good the following requirements:

All apparatus shall be free from defects of material or workmanship.

All apparatus shall be so built and installed as to deliver its full rated capacity at the highest efficiency for which it was designed.

Steam and condensation shall circulate throughout the apparatus without objectionable noise at not over one pound pressure at the reducing valve, and all parts of the heating surface, blast and direct, shall be heated under this condition. Fresh air shall be delivered at the inlets to the rooms simultaneously, in amount equal to or in excess of the volume called for in the schedule. Air shall be exhausted by the mechanical exhaust system, at the outlets from the rooms, in amounts equal to or in excess of the volume called for in the schedule.

The entire mechanical apparatus shall operate at capacity without objectionable noise or vibration.

TEMPORARY CONNECTIONS

The contractor shall set all direct radiators temporarily one time as a part of the contract, without extra compensation, when so ordered by the architect. Temporary valves shall be furnished for such temporary connections, these valves to remain the property of the Contractor, as the diaphragm valves for permanent use may not be used for temporary setting.

TEMPORARY HEATING

If the plant shall be used for temporary heating, it will be operated by the contractor, who will be responsible for it during such use. The contractor shall include in his bid the cost of operating the plant for not less than thirty 24-hour days, at the contractor's risk, including all necessary supplies except electricity and fuel. The thirty days' operation by the contractor will be for temporary heating or for adjusting and running in the machinery, as the owner may dictate. The thirty days need not necessarily be consecutive, but may begin as soon as temporary heat is needed and may terminate not later than thirty days after the completion of the building.

The contractor shall be responsible for securing a certificate from the heating inspector, in writing, at the beginning and ending of each period of operation, in case, for instance ,the operating period should be interrupted by a break-down or by warm weather. If the owner requires operation by the contractor for a period longer than the thirty days above provided, the contractor shall furnish such operation, still at his own risk, at an agreed price per day.

SUBSTITUTIONS

Certain definite makes of apparatus are specified as a minimum standard. The contractor shall bid on the basis of furnishing the makes specified without substitutions. He is invited to bid on any other makes of apparatus of equal or better quality, it being clearly understood, however, that the names of the same must be stated in the bid, together with the difference in price, if any. If it is decided by the owner to accept such substitution, the change shall be made a matter of record in the written contract. Where several makes of apparatus are mentioned and the Contractor fails to say in his bid that he prefers any particular apparatus, the owner shall have the right to choose any of the makes mentioned without change in price.

OPERATING INSTRUCTIONS AND ADJUSTMENTS

The contractor shall instruct the operating engineer in the care and operation of the apparatus. He shall adjust the speed of all machinery and shall regulate the air velocities and deliveries by anemometer test to the architect's approval. After all air deliveries and speeds have been adjusted, he shall place a conspicuous metal sign upon each fan, showing its proper speed for each general service for which it is intended. See schedule of air deliveries, direct radiation, etc., at the end of the specifications.

EXCAVATING AND FOUNDATIONS

The contractor shall do all excavating required for the installation of the material included in the contract, for all foundations, etc., furnished by him, and shall remove the dirt from the premises.

He shall furnish proper foundations for all apparatus, of masonry, corresponding with the materials and workmanship required for similar conditions in the architect's specifications and of size not less than that called for by the drawings or the requirements of the various manufacturers. He shall furnish all necessary foundation bolts, with proper plates and thimbles, for all apparatus which requires foundations.

The supply fan housing rests on the duct walls furnished by others, but the foundations for bearings must be furnished by the contractor.

CUTTING AND PATCHING

The contractor shall do all cutting and patching of other contractors' work cut or injured in the installation of this work, to the approval of the architect.

CLEANING

At the time of completion of the work, the contractor shall clean thoroughly all of the apparatus and equipment furnished by him. He shall remove all oil and foreign matter from the boilers and piping, blowing the boilers out at the surface of the water through temporary connections, as well as the rear. At the completion of the work, the Contractor shall clean all vacuum traps. He shall keep the blast and direct radiation covered during the prosecution of adjacent construction work, and will be held responsible for the final removal from the radiation of all debris, mortar, etc.

This Contractor shall be responsible for the removal of all dust, dirt or rubbish from the air conveying system, and shall have same cleaned prior

to the use of any fan and at any time thereafter as may be required.

DRYING OUT

The Contractor shall dry out the boiler setting with a slow fire for not less than two days, using fuel furnished by the owner. This drying out is separate from any temporary heating required.

DRAWINGS

The drawings prepared for the purpose of this figuring are an outline to show where certain pipes must go in order properly to avoid and to harmonize with the pipes and ducts of other contractors. The contractor shall check over these drawings carefully and may submit a suggested layout of any portion of the work that may appear to improve the efficiency of the system. If such changes are approved, they shall become a part of this contract after their approval. Such approval is limited only to approval for conformity with the general requirements of the drawings and specifications, and does not relieve the contractor of responsibility for the proper operation of the system.

Should the contractor, in going over the drawings, recognize any points which seem to him to be insufficiently or improperly cared for, to the extent of jeopardizing the guarantee which is required of him, he shall state such a situation along with his proposal, and what addition or deduction, if any, would be made in his proposal for the work as regularly specified, if such defects were remedied by him in such manner that he could guarantee the entire installation as required.

Specifications for Labor and Material

SIZE OF PLANT

The heating and ventilating plant is not designed to serve any future extensions to the building.

BOILERS

Shall be three smokeless downdraft self-contained portable firebox boilers, each 60″ in diameter and 16′ 3″ long, built for 150 pounds test pressure, in accordance with the standard rules and regulations for workmanship and material of the Ohio Industrial Commission.

The boilers shall be built by the Kewanee Boiler Company, Kewanee, Illinois. The boilers shall be provided with all regular castings and fixtures, including Century shaking grates.

All openings, except for water columns, shall have pressed steel flanges. Each boiler shall have a manhole and standard handholes. The boilers shall burn Ohio bituminous coal smokelessly within the requirements of the Toledo Department of Smoke Prevention.

TRIMMINGS

Each boiler shall have, properly connected:

One 4½″ pop safety valve, Crane No. 1101, with brass seat, set to blow at 35 pounds pressure, and drilled for boiler inspector's seal.

One fusible plug, in the crown-sheet.

Two outside screw and yoke, 125 pound flanged, globe or angle valves, one adjacent to the boiler and one at the header, the latter with wheel, and chain for operating from the floor.

One Lukenheimer Vigilant high and low alarm

water column, with chain-operated automatic gauge glass valves, Lukenheimer 1335, and three chain-operated gauge cocks, Lukenheimer 992.

One galvanized steel, 20 gauge drip funnel and drain pipe extended to the ashpit to catch the splash from the gauge cocks.

One 12" brass ring and iron case steam gauge, 0 to 100 pounds.

One 2½" extra heavy flanged blowoff cross.

One 2½" Jenkins Y blowoff valve.

One 2½" Scully Everlasting blowoff valve between the Y valve and the boiler.

FEED

There shall be a 2" special feed connection on the side of the cylindrical part of each boiler, about three-quarters of the distance from the front end to the rear end, below the water line. Each supply, drip or return connection to each boiler shall comprise, in succession, beginning as close as practicable to the boiler:

One rising stem gate valve,

One swing check valve,

One angle or globe valve with a chain wheel if the handle is not accessible from the floor.

CONNECTING TRIMMINGS

The steam gauge shall be connected with a proper syphon, and an inserted tee with a union globe valve for connection with a testing gauge. Mount the gauge above the center of the boiler with proper steel brackets attached to the boiler front The water columns shall be connected without any valves between them and the boilers, using extra heavy pipe and extra heavy crosses plugged

with brass plugs and Kewanee railroad unions. The bottoms of the water column connections shall have 1" asbestos packed blowoff cocks, blowing on the floor and pipe close to the floor.

All blowoff piping shall be extra heavy, and all fittings shall be malleable and extra heavy between the boilers and the blowoff valves.

Extend a 1¼" feed water pipe with globe valves at convenient height near the center of each space between the boilers, for boiler washout This shall have a standard hose nipple and coupling and shall be provided with 30 feet of 1¼" wire wound hose.

BOILER TOOLS

Furnish one hoe, one poker, one slice bar, three flue scrapers, one for each flue group, one 13"x17" hollow back scoop shovel.

BOILER MASONRY

Furnish and erect all necessary masonry for the complete setting, including No. 1 firebrick work laid in fire clay of grout consistency. Pave the space under the ashpit with brick on edge, resting on concrete.

The water proofing under the boilers shall be furnished by other contractors, but this contractor shall supervise its laying, so that all dimensions shall be followed properly and so that the integrity of the water-proofing may be unimpaired.

BREECHING

Shall be of No. 12 gauge steel. Brace the breeching with circumferential exterior 2"x2 ¼"

tee or angle irons every 36⅜", punched with ⅝" holes, 6" on centers for carrying rods which are to support the covering. Place a 2"x2"x¼" angle iron frame entirely around the breeching where it enters the chimney and around each smoke uptake. Furnish cast iron or steel cleanout doors at least 20"x20" for access to the breeching. The steel uptakes from the boilers shall each be provided with a 10 gauge damper. This damper shall be adjustable from the floor, with ⅝" operating rods and sockets with thumb-screws attached to boiler, after the fashion of a heavy transom life.

BLOW-OFF TANK

Furnish and install 36"x42" flanged head cast iron tank having a side inlet and set flush with the floor, wih pipes from boilers run in trench having a checkered steel cover. Attention is called to the location of the inlet, outlet and vapor connections. Other locations of these will interfere with footings.

PIPE TRENCH COVER

Furnish and install pipe trench cover of checkered steel ½" thick and 4" wider than the trench under them.

PIPE AND FITTINGS

All piping and nipples shall be Byers or Reading genuine wrought iron and shall be so stamped. All cut ends shall be reamed inside so as to insure the full internal diameter. All fittings shall be Crane Company's standard gray cast iron, heavily beaded. No bushings shall be used.

Final connections 2½″ and larger shall be flanged, using Cranite packing. Final connections 2″ and smaller shall be made with Crane No. 519 railroad unions. Anchors shall be made of pairs of heavy bar iron clamps, forged to fit the pipes and bolted in place. All water piping shall be galvanized, with cast iron fittings.

Furnish companion flanges and bolts for all diphragm valves.

SUPPORTS

Pipe hangers shall be solid ring expansion type. Ceiling radiators shall each have no less than two trapeze hangers made of capped 1″ pipe, and where more than 12 feet long shall have a pair of hangers for each 6 feet in length. Wall radiators shall have Arco supports, made by the American Radiator Company, and shall be bolted to the walls.

Furnish and erect on the forms before concrete is poured, slotted adjustable steel inserts, each about 18″ long, as made by the Truscon Steel Company, and placed not more than 15 feet on centers for supporting pipe mains.

The platform for motor No. 2 will be furnished by others.

SLEEVES, PLATES, ETC.

Where pipes pass through walls and floors they shall in all cases be provided with 20 gauge galvanized steel sleeves long enough to permit expansion and contraction. The ends of these sleeves shall have neat cast or stamped metal wall, ceiling or floor plates attached to them and not to the pipes. Where covered pipes pass there

shall be steel cups at least 4" long placed at both sides of walls and at the floors and ceilings to protect the ends of the covering.

GATE, ANGLE AND CHECK VALVES

Gate, angle and check valves shall be Crane Company's make for 125 pounds working pressure. Unless otherwise specified herein or marked on the plans, the following shall be provided:

Gate valves 2" and smaller, No. 440½.

Angle and globe valves 2" and smaller, No. 7.

Gate valves 2½", 3" and 3½", No. 465½, flanged.

Angle and globe valves 2½" and larger, No. 359 flanged.

Gate valves 4" and larger, No. 465½ flanged.

Check valves, No. 35.

Valves marked "C. W." shall have horizontal stems and shall be fitted with chain wheels, guides, and chains for operation by a man standing on the floor.

chains for operation by a man standing on the floor.

RADIATOR VALVES

Radiator valves, where not of the thermostatic type, shall be packless, made by the Marsh Valve Company, Erie, Pa., with wood handles, and unions, all nickel-plated, with composition discs Chain or cord operated valves on ceiling radiators may be Monash manufacture, packless type.

AIR VALVES

Air valves shall be Hoffman Specialty Company's No. 3 airline type, connected up to the vacuum mains on the pump sides of the vacuum traps with properly

Specialties (Continue

One special 2"

outlet, set to blow a

place on low pressure

valve, and pipe to cl

Company No. 605, flanged.

One vacuum pump governor, McAlear Manufacturing Company, No. 465.

One boiler feed pump governor, McAlear Manufacturing Company No. 803 drip tank controller.

One steam separator, Austin-Wright Company, Fig. B.

Three ~~These~~ McAlear No. 695 steam traps for draining the steam separator, the hot water heater and the humidifier coil.

One oil separator, Austin-Wright Company, Fig. S.

One Crane Company's Cranetilt No. 101 three valve vacuum traps for draining the oil separator, equipped with a McAlear No. 778 sediment trap. Make a live steam connection with this trap, having an angle valve. Place a swing check valve in the

afety valve, with angle

10 pounds pressure,

side of pressure reducing

ar covering.

Company.

WORKMANSHIP

Proper provision shall be made throughout the entire steam circulating system for expansion and contraction and drainage. The contractor shall be **responsible for the elimination of all leakage** and water hammer and for the rapid and thorough heating of all piping and radiating surface, and shall furnish all traps, valves or drainage pipes necessary to accomplish this end, it being understood that the plans and specifications may not show in detail every point at which exigencies of construction may require such special attention.

Connect up with pipe, fittings and valves all cylinder drips on all engines, pumps and compressors. Special apparatus such as the pressure reducing valve, the pump governors and all traps except the vacuum

traps shall have bypass pipes, the full size of the direct line. Place globe or angle valves on the bypass pipes and at the inlets to the bypassed apparatus. Place gate valves at the outlets from the apparatus. Install approved lift fittings at all risers in the vacuum suction mains, and provide for their proper drainage.

Erect all diaphragm valves furnished by the automatic temperature regulating contractor. All such, except when placed on direct radiators, shall have hand operated gate valves adjacent to or serving as alternates for them. Perfect drainage must be provided for both sides of diaphragm valves, whether such valves are open or closed.

Install reverse diaphragm valves and traps, connecting to the coils furnished by others, for humidity. All clean drips shall discharge into the return system or into the receiver. The main steam header shall drain to each boiler by gravity. High pressure traps shall discharge to the receiving tank.

Make both hot and cold city water connections to each boiler, and to the receiver, with proper valves, checks and unions, using galvanized iron pipe and fittings. Arrange a bypass to the sewer from the main return, with a gate valve and a check valve to prevent ingress, for draining the entire system.

Make city water connection to water jacket of air compressor and drain to the suction strainer, using globe valves on each side of water jacket.

Provide a blowoff having an angle valve, from

the receiver, also an open overflow, both having visible outlets.

Branches from steam mains to radiators and risers shall be taken off the top of the mains at an angle of 45 degrees, and shall have three elbows or equivalent flexible connections between riser bases and the main. Branches more than 8 feet long shall be drained at the risers through the traps to the return mains. Branches from risers to radiators shall be supported with brackets or floor stands at intervals of not over 6 feet. Ends of mains and indirect heater returns shall have dirt pockets with capped cleanouts, not less than 1¼" diameter and 8" long.

FLOOR DRAINS

Will be furnished by others.

All contaminated drips, such as those from the cylinder cocks and oil separator, shall terminate above these, with outlets visible. No closed circuit shall be made between the heating system and the drainage, except that for the boiler blowoff.

TEST OF PIPING

All piping shall be tested and proved tight at maximum operating pressure before insulation may be applied.

INSULATION

The following shall not be insulated:

Piping on the radiator sides of pneumatic-automatic-temperature-regulation valves, except in tempered air ducts.

The flow and return piping in the library.

Dirt pockets and dirt pocket caps.

Flanges and unions.

Vacuum returns where not in danger of freezing.

The following shall be insulated, except as above:

All steam piping, fittings, valves and steam specialties, except traps, particularly all heat radiating surfaces in the tempered air ducts.

All return piping between the receiver and the boilers, all return piping not under vacuum, and all return piping in danger of freezing.

All hot and cold water piping furnished under this contract.

All air vent piping exposed to danger of freezing.

The breeching.

The four boilers.

The hot water heater.

The receiver.

Pipe covering for steam shall be 1″ thick, an approved 85% magnesia, or Armstrong Nonpariel, or Johns-Manville asbestos sponge felted, with magnesia cement moulded jackets for fittings and valves.

Pipe covering for returns, hot and cold water, etc., shall be 1″ thick air cell. All pipe covering shall have an extra 7 ounce canvas jacket sewed on in unbroken lengths between fittings, with the seam on the top, and shall have special bands as specified under "Painting."

Insulation for the boilers, breeching and tanks shall be 85% magnesia blocks at least 1″ thick, wired in place and covered with 1″ of magnesia cement. The boilers and tanks shall have canvas, but the breeching shall be finished with hard cement without any canvas. Furnish necessary ¼″ rods

at least 3 feet long and 6″ on centers for the sides and bottoms of the breeching, inserted in holes left for the purpose, in the angle steel bracing. Wire the blocks to these rods. For the tanks, wire the blocks in place without rods. For breeching and tanks, then apply expanded metal lath over the block and imbed the metal in the cement.

LIBRARY HEATING

Shall be by a separate coal fired hot water system, arranged for independent operation and administration. The boiler shall be a W-23-T-6 water tube boiler, with Ideal metallic jacket, made by the American Radiator Company and designed for anthracite coal. The boiler shall be equipped with firing tools, dampers and all regular trimmings and fixtures. Furnish the D. & T. system of expansion-tank-in-basement hot water circulation, as sold by the Crane Company, Chicago, complete with automatic boiler draft control, pressure gauge, etc. Furnish and erect a breeching of 18 gauge galvanized steel. The piping, fittings and valves in general shall conform to the similar materials required for the steam plant. The contractor shall make water and sewer connections to nearby services brought by others. Furnish a 9″ scale hot water thermometer. Insulate the breeching 1″ thick with air cell clocks and cement, insulating the cold water piping to prevent condensation. The piping shall be carefully graded and proportioned and the system shall circulate quietly and evenly.

Specifications for Labor and Material

PUMPS

Pumps shall have cast iron bed plates and shall be brass fitted, with bronze rods adapted for very hot water. They shall be Marsh, made by the American Steam Pump Company, Battle Creek, Mich. They shall each have one-pint ~~Hills-M. Canna~~ mechanical lubricators. Each shall have a base plate. The compressor lubricators shall have two oil reservoirs and two leads, one to each cylinder, both adjustable.

Boiler feed pump: 1-8"x5"x10".

Vacuum pump, 1-10"x10"x12".

Air compressor 1-5½"x3⅝"x6" with water-cooled air cylinder.

The governor for the air compressor shall be furnished by the contractor for automatic temperature regulation, but shall be erected by this contractor.

Manzel Bros. Buffalo, Type "X N"

RECEIVING TANK

Furnish and install on proper steel foundations in the pump room, one 42" x 96" air separating and condensation receiving tank, with $\frac{5}{16}$" head and ¼" shell, with both heads bumped out, complete with manhole and flanged tappings. Place on the tank two 18" long gauge glasses with valves so as to indicate 18" each way from the center. This receiving tank shall be arranged so as to drain into the boiler-feed pump with a separate drain to the sewer, and shall have valved city water connections for both hot and cold water. These shall be run in such manner that the valves in them can be reached from the pump room floor. Connect the air outlet to the atmosphere, and arrange for a

surface blowoff and automatic overflow as per details.

HOT WATER HEATER AND STORAGE TANK

Shall be one Whitlock Coil Pipe Company's type K storage heater having at least 30 square feet of seamless copper tube heating surface in a 36" x 84" tank. The heads of the tank shall be at least ½" and the shell at least $\frac{5}{16}$" thick, with both heads bumped out. The tank shall have pipe threaded flanges for flow and return connections which will be made by others. It shall also have threaded flanges for drainage, inlet, relief, thermometer and thermostat. It shall have an 11" x 15" manhole, and cast iron saddles for support.

The tank shall be carried on 4" pipe columns and fittings as shown, the columns having floor flanges and being cross-braced. The supply connection to this coil shall have both hand and diaphragm controlling valves, the latter operated by a thermostat in the tank. The return shall have a 1¼" steam trap discharging to the receiving tank. Place on the return outlet from the tank a Sarco thermostatic trap to be used as an atmospheric air valve, provided with a drip pipe having a visible outlet.

Furnish and erect one Fulton Sylphon tank regulator No. 931, and a 1" relief valve. The trappings for the regulator and the thermometer shall be in the side of the tank at the same height.

SWITCHBOARD

Furnish and erect in the pump room a white marble gauge and switchboard, 48"x54", 1½" thick, supported on 2½"x2½"x½" angles braced to the wall. The front edges shall be beveled.

INDEX PLATES

Each switch, gauge and instrument shall have an index plate of heavy polished N. P. bronze not less than 3" long and 1½" high, with black lettering not less than $\frac{3}{16}$" high. Letters shall be deeply stamped and filled in with black before lacquering. All plates shall have stamped black borders $\frac{1}{16}$" wide and ⅛" from the edge all around. These plates shall be mounted directly beneath each switch and instrument. Sample of name plates shall be submitted for approval.

GAUGES

Erect on the switchboard the following nickel-plated ring and case Marsh gauges.

One 8½" boiler pressure steam, 30" to 100 pounds.

One 8½" low pressure or vacuum, compound, 30" to 15 pounds, showing pressure at the reducing valve.

One 8½" low pressure or vacuum, compound, 30" to 15 pounds ,showing pressure at the vacuum pump suction.

One 8½", 0 to 30 pounds, air pressure for the temperature regulating system.

One 8½", 0 to 150 pounds, city water pressure.

Connect all of these with the various sources of supply with proper valved piping. Leave space for pneumatic switches furnished by the contractor for automatic temperature regulation, accord-

ing to his requirements.

Place a 6″ compound steam gauge on the low pressure main near the outlet of the pressure regulator.

ENGINE

Shall be an American Blower Company's 14″x7″ low-pressure, medium speed, vertical center crank type, with pump oil circulation, fully enclosed, with cast iron base, throttling governor, fly wheel, pulley and ~~Hill-McCanna~~ automatic cylinder lubricator. The engines shall be erected by an approved machinist, erection by steamfitters not being acceptable. Pulley ratios shall be such as to give the engine about 175 R.P.M. when the fan speed is 188 R.P.M.

Manzel Bros. Buffalo, Type "X N"

MOTORS

The motors shall be of Wagner or Century make, 40 degrees C. for current as available at the building, to operate at about 1200 R.P.M. The motors shall be furnished with pulley and rails and shall be equipped with enclosed starters, switches and relays, having overload and no-voltage protection. The wiring will be done by others. The motors shall operate without objectionable noise. For motor sizes see the schedule of fans below.

BELTS

Furnish all necessary belting of double leather, short lap, oak tanned, made endless and glued after being thoroughly stretched in place. The belt for the engine shall be at least 9″ wide.

FANS

Shall be made by the American Blower Company and shall be Sirocco type, of standard weight.

Side sheets and scroll for fans less than 45" high shall be of not lighter than 14 gauge steel, and for fans over 45" high shall be of not lighter than 11 gauge steel. The other details of construction shall conform to the standards of the manufacturer for public building service. Exhaust fans No. 3 and No. 4 shall have overhung wheels. Other fans shall have overhung pulleys. Standard size drive pulleys shall be used, the driven pulley sizes being adjusted to accomplish the desired speed variations.

No. 1. Main supply: one bottom angular discharge, full housed, double inlet, double wide, No 9, with special extended shaft, pulley and outboard bearing. The supply fan is to deliver 47,600 cubic feet per minute at about 188 R.P.M. at about ¾" pressure.

No. 2. Auditorium supply: One bottom angular discharge, full housed, single inlet, single wide, No. 7, to deliver 14,800 cubic feet per minute at 227 R. P. M.—5 H.P. motor.

No. 3. West exhaust: One top vertical, full housed, single inlet, single wide, No. 3, to deliver 2,000 cubic feet per minute at 485 R.P.M.—2 H.P. motor.

No. 4. East exhaust: One top vertical, full housed, double inlet, single wide, No. 3, to de-

liver 2,400 cubic feet per minute at 520 R.P.M.—2 H.P. motor.

Fans 2, 3 and 4 shall have 18 gauge galvanized steel dampers, with 1"x1"x⅛" angle steel borders in the outlets, the dampers being adapted to close the outlets or to throttle them. The dampers shall swing toward the fans.

DIRECT RADIATION

Direct radiation shall be American Radiator Company's plain Peerless column and wall pattern. The column radiation shall have solid legs, 6" center of tapping to floor, except where marked for higher legs, and shall be of height marked on the plans. The radiation shall have been washed, primed and plugged at the factory. Direct radiation shall be tapped according to the following schedule:

No. sq. ft.	Supply	Return
0 — 60	¾"	½"
60 — 90	1 "	½"
90 — 150	1¼"	½"
150 — 250	1½"	½"

BLAST RADIATION

Blast radiation shall be Vento, except as noted, made by the American Radiator Company. Where horizontal, it shall be supported on 1" pipes with ½"x1½" steel bars between sections, carried by columns, beams or steam pipe, as shown on the plans and sections. The following is a schedule of the Vento radiation:

Main Bldg.	4-11)		
Tempering	4-10)	60″ x 9″ x 5″	1344 sq. ft.
Auditorium	2- 9)		
Tempering	2- 8)	50″ x 9″ x 5″	459 sq. ft.
Chamber A	2-11)		
	1-10)	50″ x 9″ x 5″	432 sq. ft.
Chamber B	2- 9)		
	1- 8)	50″ x 9″ x 5″	351 sq. ft.
Chamber C	2- 7)		
	1- 6)	50″ x 9″ x 5″	270 sq. ft.
Chamber D	2-11)		
	1-10)	50″ x 9″ x 5″	432 sq. ft.
Chamber E	2-13)		
	1-12)	30″ x 9″ x 5″	304 sq. ft.
Chamber F	2- 6)		
	1- 5)	30″ x 9″ x 5″	136 sq. ft.
Chamber G	2- 6)		
	1- 5)	30″ x 9″ x 5″	136 sq. ft.
Chamber H	2-13)		
	1-12)	30″ x 9″ x 5″	304 sq. ft.
Chamber I	2-10)		
	1- 9)	50″ x 9″ x 5″	391½ sq. ft.
Chamber J	2-10)		
	1- 9)	50″ x 9″ x 5″	301½ sq. ft.

Ground story reheaters of 20 square foot sections, 4″ on centers, sanitary pin radiation, will be listed in the schedule at the end of the specification.

PLENUM CHAMBER DECKS

Plenum chamber decks shall be of reinforced concrete at least 4″ thick, furnished and installed by the general contractor under the supervision of the heating contractor after the blast radiation shall have been erected, encased and connected.

PARTITIONS AND HOUSING

Shall be at least 20 gauge galvanized sheet metal, properly braced with galvanized angles, and assembled with bolts. The casing shall be erected before erection of the steam and return piping, so as to secure a proper fit, and shall at the staggered ends of the heaters follow the offsets so that at no point shall there be more than ½″ clearance between heater and casing.

SHEET METAL DUCT WORK

Shall be furnished and erected as shown on the drawings, using the best grade of galvanized sheets, including curves and angles which, on account of structural peculiarities, may not be fully shown and which must be allowed for. Metal curves shall be installed and cemented tight in place wherever horizontal metal ducts connect with masonry flues. The contractor shall be responsible for a perfect air delivery without obstruction or leakage throughout the air conveying system and shall joint up all cracks with elastic composition where so required. Where ducts pass plastered walls, install against the walls 1½″ x 1½″ x ⅛″ angle steel collars around the ducts. Horizontal seams in ducts shall be of

the double locked type, midway between corners, and shall be hammered flat. Vertical seams shall be of the lap type, riveted at least every two inches, or shall be locked with separate fabricated locking strips. Ducts over 30″ in width shall have galvanized structural steel angles riveted to the top and bottom for bracing at intervals of 30 inches. Metal used shall be of not less weight than the following: For ducts 18″ wide or less, 26 gauge; for ducts more than 18″ wide and not over 30″, 24 gauge; for ducts over 30″ wide and less than 48″, 22 gauge; for ducts over 48″, 20 gauge. All ducts shall be supported with flat iron hangers, attached to the sides or tops of the ducts and fastened to the structural members above with clamps or expansion bolts. Vertical ducts shall be supported at each floor.

Sheet metal removable plates shall be placed around steam and return pipes where they pass through air chamber or duct walls, so as to prevent any leakage at such points while still allowing for expansion and contraction.

SPLITTERS

Where air ducts divide, place hinged splitters made of at least 16 gauge galvanized steel, braced with angle iron and provide with substantial locking devices, AFCO K-774 and K-775, so that the volume of air may be proportioned. Steam and return piping must be so designed as to avoid these dampers.

PNEUMATICALLY OPERATED DAMPERS

Will be furnished by the contractor for automatic temperature regulation. The contractor shall erect all such dampers which are to be enclosed by or attached to metal ducts or partitions.

VOLUME DAMPERS

Volume dampers shall be placed in all vertical supply flues and branches throughout the building. They shall be AFCO K-792 for metal ducts and as detailed with cast iron weights as necessary for masonry flues. They shall be of at least No. 10 gauge black steel, and shall always swing away from the air current. The dampers shall be placed directly above the mixing dampers and shall be connected by means of steel cables terminating in No. 2 sash chains 6 feet long, to concealed keyhole plates attached for the purpose, on the diffusers. These chains shall not be visible in the room and shall be accessible only by means of ladders. The contractor shall make anemometer tests and shall adjust all volume dampers and shall place additional deflectors as may be required by special conditions, showing air distribution to the approval of the architect. AFCO air specialties may be procured by the American Foundry & Furnace Company, Bloomington, Ill.

SOUND DEADENING

Where fans join metal ducts insert canvas joints properly fastened with metal sleeves to prevent sound transmission. The foundation of the engine shall be isolated from the floor slab with a 1" joint filled with pressed cork.

Fan No. 2 and its motors, and the exhaust fans and their motors, shall be mounted upon metal-covered wood bases composed of at least three 1″ laminations, carried on a 1″ pressed cork mat The anchor bolts shall have ½″ thick rubber washers and sleeves so that no metallic or masonry contact shall be made between the floor and the wood.

REGISTERS

Furnish and erect registers or grilles with ¾″ square holes and ¼″ bars, as marked on the plans, of Tuttle & Bailey manufacture. Grilles where marked to go in doors, will be furnished and installed by other contractors. In general, registers and grilles shall be delivered painted a priming coat, and shall be painted after erection to harmonize with the various surroundings. Furnish steel wall frames for locations where there is no wood trim to which the registers or faces can be screwed.

Note: Certain grilles in gymnasium are to be hinged.

DIFFUSERS

Diffusers without register faces shall be placed on sidewall air supply openings. They shall be AFCO, plate K-88. They shall have borders at least 2″ wide and shall be painted by other contractors.

Where diffusers are placed at the ends of horizontal ducts, place steel curves where the ends leave the vertical flues. All diffusers marked type "B" shall have volume dampers integral with the diffusers, with adjustable louver blades. The flues behind all diffusers, where visible from the rooms, shall be painted black by the contractor before

erecting the diffusers. Diffusers with blades over 30″ long shall be made of 20 gauge; diffusers with blades between 24″ and 30″ shall be made of 22 gauge; diffusers smaller than 24″ shall be made of 24 gauge. Borders and type "B" diffusers shall be made of the same weight steel as the blades.

VENT OUTLETS

All side wall vent outlets, except those provided with register faces, shall have metal borders 1½″ wide, with mitered corners and galvanized steel elbows with sides, finished perfectly smooth, extending above the line of visibility and left open so that they shall be kept clean. They shall be painted by other contractors, after erection.

PAINTING

All equipment furnished under this contract shall be painted by the contractor, with the following exceptions only.

In class rooms, rooms which have radiators, and in general in all rooms which are plastered and finished for public use, others will paint the direct radiators, uncovered pipes, pipe covering (except bands), steel ducts, diffusers, grilles and vent elbows. See Painting Specifications under general contract.

This contractor shall paint as follows:

Insulation and pipe covering: One coat of gray cold water paint with bands for the whole job painted white for low pressure, red for boiler pressure, green for exhaust, black for hot condensation, etc. For city water, hot and cold, the bands shall be fur-

nished to correspond with those called for in the plumbing specifications. Paint all black steel or cast iron work, such as boiler fronts, boiler encasement, engines, pumps, fans, motors, manhole doors and uncovered piping, a priming coat of Toch Bros. Tockolith, and one finish coat of Toch Bros. No. 1375 cherry red color I. W. paint.

SCREENS

Furnish guard screens of No. 9 wire, 2" mesh, 5 feet high, in channel iron frames supported from floor and ceiling, as shown, to protect against all the belts and engine flywheel. The screen for the fresh air intake will be furnished by others.

ACCESS DOORS

Furnish to the General Contractor as the walls and decks are installed, cast iron access doors in cast iron frames for reaching all parts of all air chambers. In general, these doors shall be 20" wide and 40" high, though where space is limited, doors 20" high and 20" wide may be used. Place one 20"x20" door as above at each plenum chamber for access to base of flues. These are to be made by the American Foundry & Furnace Company, Bloomington, Illinois.

TOOLS, PACKING, ETC.

Furnish a complete set of tools for adjusting each engine, pump, air compressor, or other apparatus.

Furnish, when the plant is finished, the following new tools:

One 12″ and one 18″ Coes monkey wrench.

One 14″, one 24″ and one 36″ Trimo wrench.

Pack all valves with properly lubricated asbestos wicking. Pack all piston rods with approved piston packing, that for the engine being Garlock, Type No. 255. All gaskets on boiler headers shall be renewed by the contractor at the time when the plant shall be finally completed.

THERMOMETERS

Furnish and erect the following Taylor Instrument Company's thermometers, these shall have 9″ scales:

One for outdoor temperature; No. 800, minus 20 to 120 degrees, angle type with extension.

One, tempered air; No. 800, 0 to 200 degrees, angle type with extension.

One in the return line close to the vacuum pump; No. 101, 40 to 240 degrees, vertical type, with cup.

One, hot water supply; No. 118, 40 to 240 degrees, angle type with extension, to clear the covering.

MEASURMENTS

The contractor shall check all measurements of apparatus given herein with the spaces provided in the building, and shall be responsible for the same fitting in place into the work of other contractors in the building. Slight modifications in the sizes of dampers, diffusers, etc., may be required, but they may not be of less area than shown on the plans.

AUTOMATIC TEMPERATURE REGULATION

SEPARATE CONTRACT

(Read General Conditions)

GENERAL CONDITIONS

The general conditions of the architect's specifications, giving instructions and information relating to requirements, time of completion, alterations, permits, contract and bond, payments, drawings, etc., are hereby made a part of this specification, and contractors are required to acquaint themselves with these general requirements, which will be made a part of the contract.

Where no special quality of material or labor is mentioned, it is understood that material and labor are to correspond with that called for in the architect's specifications for similar work.

WORK INCLUDED

Under this head is included all labor and material necessary for the complete and satisfactory installation of a system of automatic temperature regulation, as shown on the drawings and as hereinafter specified.

IN GENERAL

All instructions in these specifications, such as "do," "provide," "furnish," "build" and the like are to be read and understood as directions given to the contractor and are to be followed by him accordingly.

The contractor for temperature regulation shall furnish all valves and dampers operated by compressed air. He shall erect all dampers which go in masonry and in the outlet ventilators. He shall

erect the pneumatic switches on the gauge board furnished by the heating contractor. He shall connect the compressed air gauge furnished and erected on the gauge board by the heating contractor. He shall furnish a pneumatic governor for the air compressor furnished by the heating contractor.

GUARANTEE

This system shall be installed and guaranteed by the manufacturers. The contractor shall guarantee all fixtures, apparatus and material to be and to remain without defects for a period of one year from the date of acceptance, and shall agree that should any of these prove defective within that length of time, they shall be removed and replaced by acceptable materials or apparatus, free of expense to the owner. The contractor shall as a part of his contract, guarantee that all thermostats shall cause the opening or closing of the valves or dampers to which they are connected within a temperature range of not exceeding two degrees Fahr. He shall guarantee the gradual movement of dampers and valves.

The humidifier shall be guaranteed to furnish moisture up to at least 50% relative humidity at 68 degrees temperature, and to prevent automatically any excess moisture from this source when the heating system is in operation.

TANK

Furnish and erect an air storage tank of optional size of galvanized steel, from which the temperature regulating and damper moving air lines shall radiate.

AIR PIPING

Shall be of galvanized iron and shall be concealed

in all finished rooms. The air piping shall have no appreciable leakage. It shall be run in an approved and workmanlike manner, supported with metal clips or hangers at frequent intervals, and shall be properly graded.

OIL FILTER

Place on the discharge side of the air compressor, between it and the pneumatic tank, an oil filter made of four inch pipe nipples, threaded and flanges, as per details, and provided with a ¾" blowoff pipe with an angle valve. Pack the filter compartment with steel wool.

DAMPERS

Shall be of not less than 20 gauge steel, in angle or tee iron frames, with brass bearings, and shall be approximately air-tight. Dampers with axles more than 2 feet 6 inches long shall be of not less than No. 18 steel up to 4 feet long, above which they shall be of not less than No. 14 steel, well braced. They shall be arranged to clear all piping or other obstructions. All damper motors shall have metallic bellows. The contractors shall erect all dampers except those which are placed in metal ducts. He shall be responsible for all necessary stopping off of enclosures for the dampers erected by him. At the completion of the work and before its acceptance, the contractor shall clean off all dampers in the tempered air ducts and tempered air parts of plenum chambers and shall paint them thoroughly with Toch Bros. R. I. W. paint, No. 1375.

VALVES

Diaphragm valves shall be of the angle type

wherever possible. If of the globe type, they shall be set with stems horizontal. They shall have metallic diaphragms with composition discs and all 2½" and larger shall be flanged. Diaphragm valve on radiators shall be of the angle type, with finished bodies and trimmings.

THERMOSTATS

The thermostats shall be enclosed in protective metal casings which shall have thermometers attached, provided with metal guards. The thermostats shall be of intermediate type.

SCHEDULE

The following is a schedule of the direct radiation, pneumatic and thermostatic control and volume of air supply and exhaust:

Furnish and erect six 8½"x40"x8", 20 gauge galvanized steel boxes as per details, one for each of chambers A, B, C, D, I and J, having 1" flanged front with hinged door having glass insets, as per details. The box shall be caulked and pointed up air-tight, and shall be bolted to two 1½"x1⅛"x ¼" cross angles. Others will furnish a shaded 40 watt lamp above the box, having a tumbler switch alongside each box. Mount inside each of the six boxes, complete with all necessary air piping, dampers, etc.

(A) One 3-way switch, with one damper in the supply duct.

(B) One 3-way switch with dampers in all tempered air connection to mixing dampers.

(C) One 3-way switch and one valve on steam supply to upper section of reheaters.

(D) One 3-way switch and one valve on steam supply to two lower sections of reheaters. The switches shall be self-indicating and shall have metal signs like those specified on gauges showing their function.

For each mixing damper or separate room reheater served by each chamber (from 6 to 8 each) a 2½" iron case, brass rim pressure gauge indicating whether the room is taking heated air or tempered air. Etch each dial with the room number, as shown on plans.

Place similar gauges, one on each air line between the tempering thermostat and the heaters, one on each air line between the gymnasium and the reheaters, and one on each air line between the auditorium thermostat and the reheaters. The gauges shall be close to the reheaters and the dials shall be etched to show the service.

Mount the following switches on the engine room gaugeboard and furnish with them the accompanying dampers, valves and piping:

Each switch shall indicate function and position.

E. Air supply to Auditorium: 1 switch and 2 supply dampers, 2 vent dampers.

F. Air supply to Gymnasium: 1 switch and 2 supply dampers, 2 vent dampers.

G. Auditorium and gymnasium recirculation: 1 switch and 2 dampers, one for outlet, one for recirculation, the outlet damper to be closed when there is no compressed air.

H. One switch, bypassing the thermostat on

the auditorium and gymnasium tempering heaters for quick heating prior to occupancy.

I. Bypass: 1 switch and 1 damper in the outlet of fan No. 2 and 1 damper in the bypass to the auditorium-gymnasium supply from fan No. 1. When there is no compressed air the damper on fan No. 2 is to be open and the bypass damper is to be closed.

J. One switch, bypassing the thermostat on the main building tempering heaters for quick heating prior to occupancy.

K. Fresh air intake: 1 switch and 2 louver dampers, one for fresh air, one for attic connection, the fresh air damper to be closed, the other open when there is no compressed air.

L. Main building ventilators: 1 switch and 4 dampers, closed when there is no compressed air.

Furnish and mount on the gaugeboard nickel-plated brass signs about 12″ x 6″, with lettering as follows:

"To ventilate auditorium separately: Operate switch E to open dampers in supply and vent; operate switch F to shut off gymnasium; operate switch I to open fan outlet; operate switch K to open fresh air intake; operate switch G to open roof ventilator. Shut doors under main building tempering heaters."

"To ventilate gymnasium separately: Operate switch F to open dampers in supply and vent; operate switch E to shut off auditorium; operate switch I to open fan outlet; operate switch K to open fresh air intake; operate switch G to open

roof ventilator. Shut doors under main building tempering heaters."

"To ventilate main building: Operate switches A at plenum chambers to open the dampers. Open doors under main building tempering heaters. When heating prior to occupancy operate switch B closing the cumulative dampers, until the pupils arrive and no longer. Operate switch K to open the fresh air intake dampers; operate switch K to close the fresh air damper for recirculation. When K is open for ventilating the main buildings L must be open, and when K is closed L must be closed. This does not apply when the auditorium and gymnasium are being operated separately. Open the doors under main building tempering heaters to ventilate the gymnasium or auditorium by fan No. 1, open switch I. Operate switch E to open the dampers for auditorium, or F for gymnasium. Open G if K is open, close G if K is closed.

HUMIDITY

Furnish and erect a humidity controlling instrument thru fan housing, with copper tank humidifier having copper heating coils, automatic water supply and overflow to floor drains. The tank shall be 22½" x 72" x 13" deep, containing 90 lineal feet of 2" submerged iron pipe size copper coil. The automatic temperature regulation contractor shall erect this tank upon proper steam pipe stands, and shall make water, drain and overflow connections to it. The heating contractor will make steam and return connections.

For Harvard School Building

No.	Name	Radiation	Thermo-stat	Damper	Valve	Supply	Exhaust
	Main Bldg. Tempering		1	....	2	.....	.....
	Auditorium-Gymnasium Tempering		1	....	2	.....	.....
1	Library	(a)223	....	....	....	.....	.....
2	Library	(a)206	....	....	....	.....	.....
3	Girls' Toilet	45	1	....	1	.....	400
6	Shower	90)	....	....	1	.....	.....
		*100)	1	....	1	.....	.....
6A	Storeroom (stat in 6)	45	....	....	1	.....	.....
7	Unassigned	*140	1	....	1	1380	.....
8	Lumber (stat in 9)	81	....	....	1	.....	.....
9	Manual	63)	....	....	....	.....	.....
	Training	*160)	1	....	1	1680	.....
10	Boys' Toilet	108	1	....	1	.....	800
11	Corridor (stat in 22)	72	....	....	1	.....	.....
12	Gymnasium	.....	1	....	2	4800	.....
13	Corridor	150	1	....	1	.....	.....
14	Girls' Showers	162)	....	....	....	.....	.....
		)	....	....	2	.....	.....
		*100)	1	....	1	.....	.....
17	Unassigned	*140	1	....	1	1560	.....
18	Domestic	.....)	....	....	1	.....	.....
	Science	*140)	1	....	1	1500	.....
	288 Lin. Ft. 1" Pipe	171					

Specifications for Labor and Material

No.	Name	Radiation	Thermostat	Damper	Valve	Supply	Exhaust
19	Dining Room	60	1	....	1	.....	.....
20	Sewing Room 384 Lin. Ft. 1″ Pipe	.....)	....	....	2	.....	.....
		*160)	1	....	1	1740	.....
21	Corridor	100	1	....	1	700	.....
22	Corridor	200	1	....	2	1400	.....
101	Classroom	53⅓	1	1	1	1500	.....
102	Classroom	.....	1	1	....	1500	.....
103	Girls' Toilet ..	72	1	....	1	.....	800
104	Classroom	.....	1	1	....	1500	.....
105	Classroom	.....	1	1	....	1500	.....
107	Classroom	.....	1	1	....	1500	.....
108	Classroom	.....	1	1	....	1500	.....
109	Classroom	53⅓	1	1	1	1500	.....
110	Boys' Toilet....	108	1	....	1	.....	800
111	Storage	27	....	....	....	.....	.....
112	Auditorium	.....	1	....	2	10000	.....
112A	Dressing Room	21	....	....	....	.....	.....
113	Corridor	150	1	....	1	.....	.....
114	Office	81	Hand control				
114A	Toilet	25	Hand control				
115	Office	60	Hand control				
116	Classroom	.....	1	1	....	1500	.....

For Harvard School Building

No.	Name	Radiation	Thermo-stat	Damper	Valve	Supply	Exhaust
118	Kindergarten		2	2	....	3500	.....
119	Toilet (stat in 118)	22½	....	....	1	.....	.....
120	Classroom	53⅓	1	1	1	1500	.....
121	Corridor	125	1	1	1	700	.....
122	Corridor	225	1	2	2	1400	.....
201	Classroom	53⅓	1	1	1	1500	.....
202	Classroom		1	1	....	1500	.....
203	Girls' Toilet	90	1	....	1	.....	800
204	Classroom		1	1	....	1500	.....
205	Classroom		1	1	....	1500	.....
207	Classroom		1	1	....	1500	.....
208	Classroom		1	1	....	1500	.....
209	Classroom	53⅓	1	1	1	1500	.....
210	Boys' Toilet	117	1	....	1	.....	800
213	Corridor (stat in 113)	100	....	....	1	.....	.....
214	Rest Room	162	1	....	2	.....	.....
216	Classroom		1	1	....	1500	.....
217	Classroom		1	1	....	1500	.....
218	Rest Room	90	1	....	1	.....	.....
219	Classroom		1	1	....	1500	.....
220	Classroom	53⅓	1	1	1	1500	.....
221	Corridor (stat in 121)	100	....	....	1	700	.....
222	Corridor (stat in 122)	100	....	....	2	1400	.....

ELECTRICAL WIRING

(Read General Conditions)

WORK INCLUDED

Under this head is included all labor and material necessary to install in a first-class manner, a complete conduit and wiring system for electric light and power, and for all bells and speaking tubes, all as hereinafter described and indicated on Plans.

Contractor shall take all his own measurements and shall be responsible for same, and shall do all cutting for his work and repairing after same.

INSPECTION

All workmanship and material shall conform in all respects with the latest rules and regulations of the National Board of Fire Underwriters, and the Contractor, at his own expense upon completion of this work shall furnish to the Board of Education a certificate of approval from the Electric Wiring Department of the City of Toledo, Ohio.

The Contractor shall be a licensed electrician and shall obtain proper permit from the City of Toledo before starting work.

Should these specifications conflict with the rules of the National Board of Fire Underwriters of latest issue, the Contractor shall notify the Director of Schools of such before proceeding with the work, so that same can be adjusted to the satisfaction of both parties.

SAMPLES

Each bidder shall fill out and submit with his bid a list giving the trade name and address of the manufacturer of each of the following appliances and materials he desires to use:

Steel conduit
Outlet boxes
Pull and junction boxes
Distributing cabinets
Knife switches
Wall switches
Wall receptacles
Wire

Should the successful bidder fail to submit a list of appliances conforming to Specifications, the Board of Education reserves the right to name articles and materials which will conform to the Specifications, and such selection shall be final and binding upon the Contractor.

The Board of Education reserves the right to require the Contractor to submit samples of any or all articles and materials to be used under this contract, but these samples, if approved, may be used on the work after serving their purpose as samples. Samples, if requested, must be received by the Director of Schools in ample time for their proper consideration and approval and for the execution of the work within the contract time for completion.

SYSTEM

The electric system shall be three-wire, 440-volt 60-cycle three phase, alternating service, with three-wire 440-volt branches for power and a three-wire, 110-120-volt 60-cycle, single phase, alternating service, with two-wire 110-volt branches for light.

POWER AND LIGHTING FEEDERS

The separate feeders for power and lighting will be installed by the Owner from a pole on Glendale avenue and carried on poles located on the school site (see Sheet No. 1) and then as follows by this Contractor: From a point on the pole, located 3′-0″ from the rear of lot No. 139, and at least 15′-0″ above grade, down pole, under ground to Room No. 5 and then to a point directly under the cabinets and connect with same. The two conduits shall be of galvanized iron pipe, two inches in diameter for lighting feeders and one and one-half inches for the power feeders, and shall be thoroughly water tight after installation. Cap with proper conduit entrance fittings at the pole to prevent water entering the pipes. The power feeders shall be No. 4 and the lighting feeders No. 0, lead covered.

ENTRANCE CABINET

Provide and install in Room No. 5 where indicated, Crouse-Hinds, Frank Adams, Kuhlman, or equal, subject to approval of the Director of Schools, panels and cabinets with covers.

The panel for the three-wire power feeder with

five three-wire branches for three phase, 440-volt, 60-cycle, power circuit for the ejector motors, of 10 H.P. capacity each, for the Auditorium ventilating fan motor, of 5 H.P. capacity, for the two Toilet exhaust fan motors of 2 H.P. capacity each, and the motor outlets of Room No. 9. 5 H.P. shall be Crouse-Hinds Type A, with slate frame.

The power circuits, except the one to the ejector motors, shall have double-pole, single-throw knife switches with enclosed fuses. The power circuit to the ejector motors shall have double-pole, double throw knife switches with enclosed fuses.

Furnish and mount on the panel the main switch with enclosed fuse connections. Panel shall have loop for the power meter.

The panel for the three-wire lighting feeder with five, two-wire branches for single phase, 220-volt branches to the distribution boxes and three, two-wire, 110-volt branches for the lighting circuits of Rooms No. 4, 5, 5A, 15, 15A, 16 and Toilet Exhaust Fan Rooms shall be Crouse-Hinds, Type A with slate frame. The circuit for the Auditorium exit lights shall be taken off the main panel with fuses, but no switch. The sub-mains to the distribution boxes shall have single-throw knife switches with enclosed fuses, except Auditorium circuit which shall have a double throw switch. Furnish and mount on the panel the main switch with enclosed fuse connections. Panel shall have loop for the meter.

The above panels shall be black enameled slate,

at least three-fourths inch (¾") thick; frames shall be of same slate; all copper work on face of panels, except contacts, shall be highly polished and lacquered. Name plates shall be nickel-plated.

FUSES

Each pole of all switches shall be fused. All fuses shall be cartridge new code type of D. & W., or equally good approved similar make.

A complete duplicate set of fuses, properly marked, both for mains and all branch circuits, including distribution panels, shall be furnished to the Director of Schools by this Contractor and a receipt obtained for same.

Provide and set for each switch of the entrance cabinet, for the power feeders, an engraved name plate, marked as follows: For the 10 H.P. ejector motors, "Ejector"; for the 5 H.P. Auditorium ventilating fan motors, "Auditorium"; for the 2 H.P. Toilet exhaust fan motors, "Exhaust"; and for the motor outlet of Room No. 9, "Power."

Provide and set for each switch of the entrance cabinet, for the lighting feeders, an engraved name plate, marked as follows: For the branches to the distribution cabinets, "Basement R", "Basement L", "1, 2, Floors R", "1, 2, Floors L", "Auditorium" and "Auditorium Exit."

All bus-bars, switches and connections of the entrance panels shall be of sufficient capacity to properly carry all circuits when same are loaded to full rated capacity.

METER BOARDS

Provide and install for both the power and lighting meters, meter boards, with lugs for meters, of black enamel slate, twelve by twelve by seven-eighths inches (12″x12″x⅞″).

DISTRIBUTION CABINETS

Provide and install in corridor of basement, first and second floors, and in Dressing Room No. 112B of first floor, seven (7) Crouse-Hinds, Frank Adams, Kuhlman, or equal subject to the approval of the Director of Schools; distribution panels with cabinets and trim.

Panels shall be similar to Crouse-Hinds, Type "A," three-wire, 220-volt mains, with two-wire, 110-volt branches. Mains and branches shall have switches and enclosed fuse connections. Panels shall be slotted for both mains and branches, and shall have slate frames.

The panels shall have Crouse-Hinds "CP" cabinet and trim; trim shall be Georgia pine, finished to match sample. Cabinets shall have inclined bottoms.

Provide and install on wall of Room No. 9 where indicated and as directed by the Superintendent, one (1) Crouse-Hinds, Frank Adams, Kuhlman, or equal subject to the approval of the Director of Schools, distribution panel with cabinet and trim. Panel shall be slotted for both the main and two branches, of 30-amperes for 2½ H.P. capacity each, and shall have slate frames. The cabinet and trim shall be as specified for the panels for the lighting circuits.

All panels shall be of black enameled slate, three-

fourths inch (¾") thick with black enamel slate frame, all copper on face of panels, except contacts shall be highly polished and lacquered; cabinets shall be finished with two coats of P & B compound. Note that the cabinets of first floor shall have the mains carried through.

DIRECTORY

This Contractor shall furnish with each light-distributing cabinet, a directory for all circuits controlled by that cabinet. The directories shall be printed in black ink on heavy white cardboard, and one dozen copies of each directory shall be furnished to the Director of Schools. One copy of each directory shall be mounted alongside of the main fuses on its panel and held in place by eight neat brass removable clips, or mounted in a neat brass card frame of the proper size. Height of lettering on directories shall be not less than three-thirty-seconds inch (3/32") with proper spacing and directory shall be divided, one-half for left and one-half for right-hand circuits, mounted to right and left main fuse if necessary.

INTERIOR CONDUITS

Provide and install a complete system of conduits for power circuits, lighting system, fire alarm, signal and call bells, and exterior telephone system.

Conduits shall be run concealed, except as hereinafter noted, to switch and various other outlets as located on plans and in such manner as to avoid hot pipes, flue openings, etc. Conduit in boiler room, coal room, fan room, engine room, machinery

room and attic space shall be run open and parallel to wall and beam lines.

Dotted lines shown on plans connecting switches and various light outlets are not to be construed as conduit locations, but merely indicate the manner in which the lights are controlled.

This Contractor shall work out and submit for approval, before commencing work, a complete set of conduit plans to scale.

Outlets of closets, stock rooms, etc., shall be on the same circuit as the outlets of the room with which they connect.

QUALITY OF CONDUITS

All conduits shall be smooth inside and out, and shall be Sherardized and enameled, and shall not chip or scale if the conduit is bent to a mean radius equal to six times the diameter of the conduit.

All conduits for branch circuit shall be at least five-eighths inch (⅝") inside diameter, and for the three-wire lighting lines not less than three-fourths inch (¾") conduit shall be used. All wires of any one circuit shall be run in the same conduit.

Sharp bends in conduit are to be avoided, and not more than three right angle bends will be allowed in any run between terminals.

In conduits one inch (1") and over, standard electro-galvanized conduit elbows may be used, but in no case shall conduit be heated to make bends if elbows are not used.

All joints in conduits shall be screwed together pipe to pipe, made up with white lead, neatly aligned and securely held in position during construction of

the building. Ends of conduits shall be reamed smooth.

Conduits in cement floor shall be run over reinforcing steel. All conduits, except those in Rooms Nos. 4, 5, 5A, 15, 15A, 16, and Toilet exhaust fan rooms and attic shall be concealed.

(Note—There will be eight outlets in the attic space as shown on sheet No. 7).

Finished open work must be securely anchored with pipe straps not over 5'0" apart.

Attention is called to conduit work mentioned under head of main feeds, telephone, bells and gong.

All conduits shall be thoroughly and permanently grounded, independent of gas piping. Where necessary to use wire, same shall be No. 6 copper.

Note—The sub-mains from the entrance cabinet to the distribution boxes on second floor shall run through the boxes of first floor.

OUTLET BOXES, LOCATION OF OUTLETS AND PULL-IN BOXES

Each outlet shall be provided with an approved electro-galvanized steel outlet box, made up of not less than No. 12 B & S gauge steel. All light outlet boxes shall be circular boxes, four inches (4") outside diameter. Each light outlet box shall have a three-eighths inch (⅜") standard fixture support, firmly secured in place by means of stove bolts and nuts. Each outlet box shall also be provided with locknut outside and locknut and bushing inside at each conduit entrance. Outlet boxes shall be properly secured in place at right angles to ceiling or

wall. All fixtures outlet boxes of all class rooms of basement, first and second floors shall have covers.

All ceiling outlet boxes in floor slabs shall be not less than two and one-fourth inches (2¼") deep, so that conduits will run on top of steel in concrete slabs without bending. When steel forms are used for concrete, the conduits may be run between joists, but shall be thoroughly supported by some other means than resting on metal lath.

Note the frames detailed on sheet No. 27. These frames will be furnished by another contractor but shall be set by this contractor, as indicated, at the ceiling outlets of gymnasium.

Outlet boxes in suspended ceiling shall be securely fastened to the furring above ceiling.

Where outlets are indicated in panels, they shall be truly centered, and outlets in any one room or hall shall be in correct alignment.

All bracket outlets shall be located six feet six inches (6'6") above finished floor level, except in halls where they shall be placed seven feet (7'0") above finished floor level.

All switch outlet boxes shall be located as close as possible to door openings, where so shown.

Outlets under no condition will be allowed in blackboards.

Approved electro-galvanized pull-in boxes, com- in drawing in wires.
plete with covers, and similar in design and con- the conduit system where necessary, for convenience
struction to the outlet boxes, shall be installed in

Note the two branches for motor outlets in Room No. 9 shall be left in proper shape for connecting the wiring to two 2½ H.P. motors.

CONDULETS

All condulets shall be Crouse-Hinds, or equal, of type best adapted to the purpose for which they are to be used: Outlets of Rooms Nos. 4, 5, 5A, 15, 15A, 16, toilet exhaust fan rooms and attic shall be provided with conduit fittings.

WIRING

All wiring shall be done to furnish light and power throughout the building, all as indicated on plans. The symbols used to indicate the purpose for which the various outlets are intended, are shown on plans.

No wires are to be pulled until plastering in the building is finished and conduits are made free from moisture by swabbing unless instructions to the contrary are given by the Director of Schools.

This Contractor shall leave proper tapped ends of sufficient length at all outlets where future fixtures are to be mounted, so that the fixture Contractor will have no difficulty in mounting fixtures and controlling them by proper switches.

WIRE

All wire shall be double braided, rubber covered wire of Habirshaw "Red Core," or equally approved similar make acceptable to the Director of Schools.

No wire smaller than No. 14 B. & S., shall be used, and all wire larger than No. 10 B. & S. shall be stranded.

All wires shall be run continuous from outlet to

outlet and all joints shall be properly soldered and taped.

MOTOR CONNECTIONS

This Contractor shall run all connections to motors, starters and between starters and motors. Motors will be provided with starting switches, and relays furnished by the Heating Contractor, but this Contractor shall mount the starting switches on suitable one-inch (1") polished slate backs and secure same to walls.

All connections between switches, relays and motors shall run in conduit with condulets at all open ends.

SWITCHES

All knife switches throughout shall be equivalent to Crouse-Hinds Type "B."

All wall switches, unless otherwise specified, shall be Hubbell Toggle switch No. 8121, with plate No. 8291, or similar and equal.

Three point and four point switches are to be installed wherever so indicated, and as follows:

Basement—Eight ceiling outlets and one wall outlet controlled by 3-way switches in basement and first floor.

Stair Landings—Outlets at each entrance stair landing, controlled by four-way switches in basement, on landing and at first floor.

First Floor—Eight ceiling outlets of corridor controlled by 3-way switches, and two ceiling outlets of corridor controlled by 4-way switches.

Second Floor—Four ceiling outlets of Corridor controlled by 3-way switches. Five ceiling outlets

of Corridor controlled by four-way switches. Ceiling outlets over each stair controlled by 3-way switches on first and second floors.

All switches shown at same location as distribution panels shall be mounted in the trim of same. Note that all outlets of Auditorium, except exit lights, are controlled by switches at cabinet in Room No. 112B.

One exit light shall be located over each auditorium door on both main floor and balcony. All such lights shall be on one lock switch, controlled independently of the distribution cabinet in Room No. 112B.

All switches in corridors and in Rooms Nos. 3, 6, 10, 14, 103, 110, 203 and 210, shall have lock attachments operated with detachable keys. One dozen keys shall be furnished the Director of Schools.

Where more than one wall switch appears at any one point they shall be mounted in one switch box with single gang plate. The finish of all switch plates shall be dull brass to match hardware.

All wall switches in connection with exposed conduit shall be 10 amperes, Hubbell, "H. & H." or Perkins snap switches mounted on Crouse-Hinds "G" or "H" conduits.

Note—Outlets in all rooms shall have wall switches where so required by the City Inspection Dept., whether so indicated or not.

The motor outlets in Room No. 9 shall each have Mason Safety Switch properly mounted on wall for future connection to motors.

RECEPTACLES

The wall receptacle indicated as base plug in corridors and Rooms Nos. 2B, 9, 12, 18, 20 and stage shall have "H. & H." catalogue No. 2001, or equal, 10-ampere, 125-volt, flush receptacle complete with plug. The ones in Rooms Nos. 9, 18 and 20, shall have a switch and lamp receptacle in front of plug, lamp receptacle to take pilot light, plug 3'0" above the floor, or receptacles with warning lights may be used.

Note the base plug outlets in corridors of each floor shall be set 3'0" above the floor.

The stereopticon receptacle in Auditorium balcony shall be of 30 amperes capacity, approved by the Director of Schools, and shall be complete with outlet box and plug.

SPEAKING TUBES

The Contractor shall furnish and install a speaking tube system connecting points indicated on plans in Room No. 115 with Rooms 5 and 216. Same shall have heavy nickel plated mouthpieces, but no whistles. The mouthpieces in Room No 115 are to be on a gang plate. Install in connection with this speaking tube system and where indicated on plans, a bell call in Room No. 5 from Room No. 115 and a buzzer call from Room No. 115 with Room 216 and from Room 216 with Room No. 115. Speaking tubes must be proven tight and open before the plastering is done.

Push buttons are to be located in Rooms 115 and 216, but not in Room 5. Plates for push buttons shall be heavy struck beveled or cast brass

and the one in Room No. 115 shall be a gang plate of sufficient size to include the word "Janitor" in letters not less than three-eighths inch (⅜") in height below the button for the bell call to Room No. 5 and to include the words "2nd Floor" and in letters not less than three-eighths inches (⅜") in height below the button for the buzzer call to Room No. 216.

Finish plate to match hardware. Batteries for testing and conduits and wires for the above shall be specified for "Bells."

BELLS

The Contractor shall furnish and install the following bells in a conduit system as specified for electric lighting. They shall be operated by dry batteries of sufficient power to operate all bells without fail for an entire school year.

Batteries shall be placed on an oak shelf, located in Room No. 5, of sufficient size to accommodate six batteries in addition to the number required to operate the system. This shelf shall be mounted on two neat, japanned cast shelf brackets.

After installation the entire system shall be tested out free from grounds and to the entire satisfaction of the Director of Schools.

Install at each entrance except East Terrace entrance eight-inch (8") weather-proof bells, acceptable to Director of Schools. These bells will be operated simultaneously by a push button mounted where shown in Room No. 115.

Push button plate, heavy struck or cast beveled brass, shall be of sufficient size to include the

word "Call," below, in letters not less than three-eighths inch (⅜") in height. Finish of the plate will match the hardware.

Furnish and erect a four-inch (4") bell where shown in Room No. 5. This bell will be operated by a push button mounted outside the Glendale Avenue entrance door. Push-buttom plate shall be beveled struck or cast brass of sufficient size to include the word "Janitor," in letters not less than one-half inch (½") high below the button. Plate shall be finished in dull brass.

Wire for all of the above bells shall be No. 16 B. & S. gauge rubber covered. Wire shall run continuous, between terminals, splicing under any circumstances not being allowed.

TELEPHONE

Provide and install for an exterior telephone, 1¼" iron conduit of kind hereinbefore described, in the wall of Room No. 115, this conduit shall start about 1'-10" above floor of Room No. 115, and shall be carried to cabinet in Room No. 5. Cabinet shall be 20"x30" set on wall with locked door. Run conduit from cabinet out of the building under ground, to the pole located 3'-0" from the rear of Lot No. 139, up same 15'-0". Pull a fish-wire in this conduit and leave same.

Put a neat outlet box where directed; box shall have heavy brass cover. Wires will be installed by the owner.

FIRE ALARM

Furnish and erect a fire alarm signal complete with gongs, operating mechanism, name plates and

conduit installation as described or detailed on Plans. Erect approved trip eighteen-inch (18") gongs eighteen inches (18") from basement, first floor and second floor ceilings where shown, and connect to the operating mechanism.

Install a vertical conduit line in the corridor wall where shown from a point two feet (2'0") above the basement floor up to roof space.

At two feet six inches (2'6") above each floor and at eighteen inches (18") from basement, first floor and second floor ceilings install a standard electro-galvanized outlet box of not less than No. 12 B. & S. gauge steel by means of locknuts outside and locknuts and reamed bushings inside. Cap the lower end of line. Especial care must be exercised during construction to keep this line perfectly straight and plumb, as a slight variation may render the system inoperative.

Install in this conduit a one-fourth inch (¼") galvanized iron pipe with a galvanized iron pipe tee at each outlet box. Pipe must be continuous between outlet boxes, screwed pipe to pipe and made rigid.

Attach to each tee a three-eighths inch (⅜") solid steel nipple, with one-fourth inch (¼") iron pipe threads on one end, of sufficient length to reach through the face plates and attach to operating handles and gong pull as shown on details. Furnish and attach, neatly turned wood handles with N. P. cast brass ferrules, tapped and threaded to fit three-eighths inch (⅜") steel nipples.

Attach face plates of cast beveled brass, dull brass finish with slot and lettering as shown.

The interior pipe shall be carried up into roof space and shall be counterweighed heavily enough to return pipe to position after same has been pulled down. The outside pipe shall be filled with lubricant.

Counterweights shall be attached by means of flexible wire cable which in turn shall be secured to counterweight lever arm secured to roof.

TESTING

Make all tests of the installation during the progress of the work, and upon completion as required by the Director of Schools; the Contractor shall pay for all inspection fees, shall provide instruments for the tests, and shall furnish the Director of Schools, upon completion of the work, with Certificate stating that the work has been inspected and approved in every particular.

The tests shall be as follows: A voltmeter test and an insulation test which shall result in not less than one megohm resistance, between conductor and ground, before any fixtures are attached.

The voltmeter test shall show not over one volt drop in potential at any lamp when all circuits are loaded to full capacity.

CUTTING AND PATCHING

This Contractor shall do all necessary cutting of holes through floors, walls and partitions, under the supervision of the Superintendent in charge, and shall do all patching and repairing in a neat and careful manner.

GUARANTEE

This Contractor shall guarantee to keep the entire system and each and every part thereof in perfect condition, usual wear and tear excepted, for a period of one year from date of final acceptance of the work and to remedy, without expense to the Board of Education, all defects, whether in material, workmanship, or operation, that may become apparent during this period. The bond provided by this Contractor shall cover this guarantee.

GENERAL

The Electrical Contractor shall work in harmony with the Contractor for re-enforced concrete at all times, and when steel is being laid on form work this Contractor shall follow up with his conduit work so as not to cause any delays in pouring concrete. Any loss to the Contractor for concrete work caused by delays of the Electrical Contractor in not having material or men on the ground will be charged against his account and deducted from the price of his contract.

The entire work shall be executed in a neat and workmanlike manner and as specified or detailed and if the exact method is not specifically mentioned in the Specifications, or indicated on the Plans, then it shall be done as the Director of Schools may direct.

PLUMBING AND GAS FITTING

(Read General Conditions)

WORK INCLUDED

Under this head is included all material and labor necessary for the satisfactory installation of all piping for gas and water supply, waste, ventilation of waste, the plumbing fixtures and appurtenances and all slate work of toilets and showers.

WORK NOT INCLUDED

The system of soft and hard tile drains and sewers including clear water basins, will be furnished and installed by other Contractors and are not included under this head.

IN GENERAL

The Contractor shall work in harmony with the Contractor for drainage system and shall make connection to all Ys and other openings left in the drainage system in order to make the entire plumbing system a complete one of its kind.

The Contractor shall take all his own measurements and shall be responsible for same.

Any necessary chipping or cutting of brickwork or concrete joists shall be done by direction and under the supervision of the Superintendent in charge.

As the work on the building progresses, the Contractor shall properly set sleeves in floors, walls and partitions for his work.

SUBSTITUTIONS

Certain definite makes of material and fixtures are specified. The Contractor shall furnish the makes specified without substitution unless he states in his bid that he contemplates furnishing other makes, in which event, if it is decided to accept the substitution, the specifications will be amended prior to the award or signing of the written contract.

MATERIALS

All materials shall be new, and the best of their respective kinds.

Bidders shall fit out a list giving the trade name, and name and address of manufacturer of each of the following materials he desires to use:

Water Closets
Urinals
Lavatories
Shower Fixtures
Sinks
Drinking Fountains
Valves
Faucets
Non-Siphoning Traps

CAST IRON PIPE AND FITTINGS

All cast iron pipe and fittings shall be the inside diameter specified, and of the weight known as extra heavy. Cast iron pipe shall be smooth inside, with outer and inner surfaces concentric, sound, free from defects and of iron that will cut well. All pipe marked X-H on the drawings is cast iron.

Any pipe cracked in cutting or otherwise broken, shall be at once removed from the building and shall not be used in any part of the work.

Fittings for cast iron pipe shall be especially made for drainage purposes and shall be of the same inside diameter as the pipe with which they are to be used and of equal quality and weight in all parts. These fittings shall include elbows, bends, "Y" branches, traps, etc., and shall have proper hand holes located wherever necessary, brass screwed plugs as will be directed.

All cast iron pipe and fittings, except as noted below, shall be coated both inside and outside with hot coal tar varnish. All cast iron pipe and fittings exposed to view in all corridors and rooms, except closets and storerooms, shall be uncoated.

All fittings supporting soil, waste or vent risers shall have extra heavy long quarter bends with foot rest supported upon concrete piers and with clean-out opening coming flush with floor.

JOINTS IN CAST IRON PIPE

All joints in cast iron pipe shall be caulked with soft pig lead. The joints shall be tightly caulked with oakum, leaving not less than one and one-half inch (1½") of lead room. A clay roll shall be used to make the joints, and it shall be so put on that after caulking the lead will finish flush with bell. The joints shall be run full of lead at one pouring, and if it does not fill perfectly the lead shall be cut out and refilled. If any lead has run through

to the inside it shall be removed and the joints left smooth.

The joints shall be caulked with proper tool and hammer, then trimmed and finished smooth with end of bell.

WROUGHT IRON PIPE AND FITTINGS

All back air connections, except the short connections and as noted hereinafter, all water supply piping, except the service, and all hot water piping, except that concealed in walls and floors, shall be galvanized, genuine wrought iron pipe, equal in quality, weight and dimensions to A. M. Beyers' or Reading, full card weight, galvanized wrought iron pipe.

Pipe shall have all burs removed by reaming and shall have standard clean cut threads. All nipples used in connection with this work shall be genuine wrought iron of same quality as the pipe.

All fittings for wrought iron pipe shall be of standard grey cast iron, square beaded. All joints shall be screwed up to a tight fit with red lead.

Fittings for the junction of cast iron and wrought iron pipe shall be made with a shoulder, threaded and shall be of the same inside diameter as the pipe.

VALVES

All gate valves two and one-half inches (2½") and over shall be double seated gate valves similar to Lunkenheimer's Fig. 243, "Victor" valves of best quality grey cast iron, steam metal, with bronze stems, seat and boxing.

All gate valves two inches (2″) and smaller shall be double disc gate valves, similar to Lunkenheimer's Fig. 427 brass throughout.

All globe and angle valves two and one-half inches (2½″) and over shall be similar to Jenkins Bros.' standard pattern, iron body, composition mounted with yoke, similar to Figs. 141 and 143.

All globe and angle valves two inches (2″) and smaller shall be Jenkins Bros.' standard pattern brass globe valves, Figs. 106 and 108. Unions shall be placed in lines ahead of all valves, ground joint unions in lines 1″ and smaller and flanged unions in all lines over 2″.

All check valves shall be horizontal swinging checks similar to Pratt & Cady's make. All two and one-half inches (2½″) and over shall be iron body brass mounted, and all two inches (2″) and under shall be brass throughout.

Place back-water valves at all points indicated, each shall have hand hole extension with extra heavy brass screw plug with countersunk holes, flush with floor.

All valves and fittings in N. P. brass pipe shall be heavily nickel-plated and polished.

HANGERS AND SUPPORTS

All brackets, clamps and hangers shall be of wrought iron of an approved type, acceptable to the Director of Schools. The spacing of hangers and supports shall not exceed ten feet (10′ 0″) on pipes one inch (1″) and over, and six feet (6′0″) on three-quarter inch (¾″) and smaller. All water

piping shall be free from traps. Where traps in pipes are unavoidable, proper drain valves shall be provided.

Chain or wire hangers will not be permitted under any circumstances.

PIPE SLEEVES AND FLOOR PLATES

Pipe sleeves made of galvanized iron, one-half inch (½") larger than the outside of pipe for which they are intended, shall be provided and set in place for all pipes passing through walls and floors.

Sleeves for 1¼" pipe shall be No. 26; 1½" and 2" pipe, No. 24; 2½" and larger pipe, No. 22, U. S. G.

The sleeves shall be set in place by this Contractor as the work progresses.

Heavy nickel-plated white metal floor and ceiling plates shall be fitted around all pipes where they pass through floors, ceilings or walls in finished rooms; cast iron floor plates in all other rooms. Where pipes pass through slate work, they shall have cast brass N. P. flanges, thoroughly secured to slate.

EXCAVATION

This Contractor shall do all the necessary excavating in the construction of the work included in this Specification, and all sheathing and bracing with proper materials which may, in the opinion of the Director of Schools, be necessary for the protection of foundation or walls of the building, and shall keep all excavation free from water by pumping or bailing during the progress of the work.

A line shall be used to lay out all trenches, and there shall be no variation from the plans, except by written permission of the Director of Schools.

All branch connections to sewers shall be laid in open trenches not less than two feet (2'0") wide at the bottom.

Consult the drainage plan and run all cast iron piping as shown. Make careful levels throughout the length of the different drains to insure the proper grading of the pipes.

When directed by the Superintendent (in no case before) fill in about the pipes with the excavated earth, wetting down and tamping solidly every twelve inches (12"). No trenches shall be filled till drains have been tested, and approved by the Director of Schools.

Where old sewers inside the building are disconnected, they shall be properly plugged by this Contractor.

CLEAN-OUTS

All clean-outs occurring in the floors of finished rooms of basement, and where so marked shall be Garvey's patent clean-outs (Peck Bros). The ones occuring in the floors of finished rooms shall be set about 1½" below level of same, and shall have galvanized cast iron boxes with cast brass hinged covers, covers set flush with floors.

All other clean-outs shall be extra heavy cast iron with brass screw jointed plugs.

Clean-outs shall be provided where shown or called for by the drawings or the rules of the Build-

ing Department, and whenever in the opinion of the Director of Schools they are necessary.

SOIL PIPE AND IRON DRAINS

The drains shown on plans and noted as X-H and all soil stacks shall be of cast iron of the weight known as extra heavy. Asphalted inside and out, except where exposed to view in finished rooms free from sand holes and spongy places, and first class in every respect. Where exposed to view in finished rooms, pipe shall not be coated.

Fittings for all above cast iron pipings shall also be extra heavy. The cast iron piping shall be carried through the outside wall, and connected with the sewer, as indicated.

All risers shall be of sizes indicated on the plans and shall be securely clamped at each floor to beams or walls; at any deflection from the vertical a firm support by bracket or hanger shall be installed.

In no instance shall toilet room floors be raised to allow space for the plumbing pipes.

Plumbing pipes shall be concealed whenever possible behind partition in vent space, etc. All piping exposed to view shall be installed in an especially neat manner. In general all vertical piping shall be carried up in walls, except in walls exposed to frost.

Where soil stacks are continued as vents and are specified wrought iron they shall be continued with X. H. C. I. at least three feet (3′) above fixture.

Soil and waste connections to individual fixtures shall be of the following sizes:

Water Closet ----------4 ″ diameter

Slop Sinks ----------3 " diameter
Urinals ----------3 " diameter
Individual Shower Baths ----------3 " diameter
Lavatories with one Basin ----------1¼" diameter
Standard Sinks ----------1½" diameter
Drinking Fountains ----------1½" diameter

This Contractor shall consult the drainage plan for the different levels for the cast iron drainage system.

The waste from the closets and urinals of the six main toilets shall be under the basement floor for the boys' toilet of the basement, on the basement ceiling for toilets of the first floor and above the suspended ceiling of the first floor, for toilets of the second floor. These wastes shall all enter 4" which shall be carreid to the main soil stacks at points shown. The above waste lines shall be extended and carried up and out through roof as vents, the extension from each floor being connected to the main extension not less than 3'-6" above the top of floor.

The two main soil stacks shall be carried up and out through the roof and may receive various vent lines in the roof space, or be extended through the roof separately.

The main waste line consists of two branches, beginning at each end of building and pitching towards ejectors, which are near center of building; these two lines shall be joined together and carried into ejector, these main branches shall be kept as close as possible to ceiling of duct. The

waste from ejector shall be 10 X. H. run on ceiling of duct and connected to hard tile as shown.

The waste from kindergarten toilet and lavatory shall be carried across ceiling of Room No. 20 and down chase to main waste line.

The waste from the lavatory and the combination sink and laundry tray in Domestic Science Room shall extend out from wall. The waste from the slop sinks shall be in the floor. This shall be 4″ X. H. connected to main waste.

Waste from toilet in Library shall run under floor as shown and connect to main toilet wastes.

The waste from second floor rest room shall be 4″ X. H. carried down chase in main corridor.

The waste from the Engineer's toilet and sink shall be 4″ X. H. carried along wall of Engine Room and under floor of Room No. 17 to main waste line.

The waste from first and second floor slop sink near main corridor shall be 3″ X. H. carried down chase in corridor as shown.

The waste from toilets in Room 114 shall be carried across ceiling of Room 14 to chase in wall and connect to main waste as shown.

The waste from Teacher's toilet, Medical Inspection Room, and from slop sinks shall be run in one 4″ X. H. stack carried down vent flue and under basement floor to main waste.

The waste from the closet tank and urinal trough in lumber room shall be 2″ carried to storm water sewer.

The waste from the lavatories in boy's main

toilet shall be carried down chase and under basement floor as shown. The waste from the lavatory in Girl's toilet basement shall be run under floor and connect to main waste. The lavatory wastes from girl's main toilet shall be run in chase and under basement floor as shown.

The drinking fountains, main corridor, shall waste into a 2" X. H. stack and extend down and connect with storm water sewer.

EJECTORS

Furnish and install where indicated on plans one Shone Duplex Pneumatic Sewage Ejector each ejector having a rated capacity of 100 G.P.M against a total head of 5' measured from invert of inlet sewer to highest point in discharge line when operating at one discharge per minute when handling raw sewage. Ejector shall be constructed with heavy cast iron receivers tested to not less than 50 lbs. air pressure.

All pipe connections to receivers shall be flanged and discharge connection shall be made at bottom of receiver so that no sedimentation in receiver will be possible. Separate connections to receiver for inlet and discharge shall be provided, and no piping of any sort in the interior of ejector receiver will be allowable. Inlet and discharge check valves shall be special flanged non-clogging swing checks placed in horizontal position with seats having rectangular water passages and flaps. Gate valves shall be flanged of the double gate bronze fitted type and shall be provided on inlet and discharge of each ejector.

The operation of each ejector shall be controlled by automatic air valves with bronze cylinder and double bronze piston. Ejectors will be of the type S.D.V. in which the main operating valves shall be supported on suitable supports at floor level. Valves shall be operated by open cast iron bells rigidly attached to bell rod, counterweights, steel links and levers having a rise and fall not exceeding 1½" with no sliding parts in the interior of ejector.

This contractor shall provide proper concrete foundations for compressors and motor with 1" cork under machine and rubber washers for the foundation bolts.

The two air compressors shall be provided and installed by the Plumbing Contractor. They shall be provided with motors and all automatic equipment.

Compressors shall be Ingersoll-Rand ER-1, straight-line belt driven, size 7"x5" to be designed to operate at 400 R.P.M. and 100 gauge pressure with a capacity of 77 cu. ft. free air per minute, with a working tank pressure of 10 lbs. to 30 lbs The intakes shall be provided with approved air filters.

Each compressor shall be equipped with motor belted to compressor with Ingersoll-Rand standard short belt drive arrangement with floating bracket and idler pulley. Belts shall be the best endless double leather belt of proper size.

Motors shall be slow speed 10 H.P., 40° for alternating current, 440 volt, three phase, 60

cycles, 1200 R.P.M. and shall be provided with slide base. Motor shall operate without objectionable noise. Automatic control shall be provided consisting of self-starter, adjustable automatic pressure regulator, knife switch, fuses and phase protective device.

Compressors shall have A-69 Ingersoll-Rand starting unloader and A70 automatic water shut-off valve.

Automatic start and stop control to be controlled by the air pressure in the receiver.

All electric devices to be installed in approved steel cabinets, wiring to be done by others.

Compressors to be cross connected and valved to permit the operation of either or both machines.

Provide and install one 42″x7′-0″ black steel air tank tested to 100 lbs. pressure and supplied with pressure gauge, blow-off and drip cock. Tank shall be supported near the ceiling in compressor room with approved supports. This contractor shall make all connections between ejector and compressors, and all water and waste connections to compressors, making the water and waste connections to the nearest lines available.

Run the exhaust from the compressors to a vent stack as directed.

CONDUCTORS AND ROOF DRAINS

Provide and install all conductors as shown by the drawings. They shall be of extra heavy cast iron pipe, same as the soil stacks and shall be in-

stalled in same manner. Conductor lines shall not be exposed in duct. Bring hub of pipe at proper location to receive the downspout heads, and caulk at the connection. Roof drains shall be provided and set by plumber.

The roof drains shall be Josam Manufacturing Company's No. 400, Series S, with clamping ring, gravel stop and cast iron connectors for caulking to cast iron pipe.

Roof drains shall be fourteen (14) in number with outlet size as shown on the roof plans.

VENT PIPING

All cast iron soil lines, as noted under "Soil Pipe and Iron Drains," shall be carried up through roof as vent pipes.

All fixtures, except when impracticable, shall be vented, and wherever possible vents shall be concealed in floor, wall and partitions. This Contractor shall direct the Mason Contractor where to leave niches for back vent pipes, or shall cut said niches in a neat manner.

Fixtures not vented shall be supplied with approved deep seal traps.

All vent pipings, except as hereinafter noted, and except short connections, shall be galvanized iron (see wrought iron pipe and fittings).

Take a 3" back vent from closets of Kindergarten, carry across ceiling and in corner of toilet, connect back vent from lavatories and drinking fountain and extend up through corner of coat room, second floor, and through roof.

Take a 1¼" wrought iron back vent from sinks,

1¼" back vent from lavatories, and 1½" back vent from slop sinks in Domestic Science Room. Carry up wall to point just below ceiling and connect vents into a 2" W. I. line and extend in horizontal chase to corridor wall, extend up in chase and through roof.

Take a 1¼" wrought iron vent from lavatory in Library toilet and carry up chase. Take a 1½" back vent from lavatories in girl's toilet, basement, and carry up chase to ceiling, across ceiling and connect to vent from Library lavatory, continue with these vents up chase and connect with vents from lavatories in girl's main toilets. Carry up with 2" B.V. to attic and connect with the B.V from second floor rest room. The vent from rest room shall be 4" X.H. carried up in chase.

Take a 2" W.I. B. V. from closet in Library toilet. Carry up in chase to above suspended ceiling and connect with B.V. of girl's main toilet.

The B.V. from the Engineer's sink shall connect with B.V. from toilet and continue up chase and through roof.

Take a 2" B.V. from slop sinks on first floor near main corridor and carry up chase to point 3' 6" above slop sink on second floor and connect with the 4" stack and continue stack through roof

Take a 2" B.V. from closet in toilet of Room No. 114, take 1¼" B.V. from lavatory of Room No. 114. Carry this B.V. exposed on wall of toilet room and connect with vent from closet and extend up chase to attic space and connect to 3" vent from slop sinks and closets.

Take a 2″ B.V. from slop sink in Janitor's closet in basement and carry up vent flue, connect 2″ B.V. of slop sink on first floor, 2″ B.V. of closet in teacher's rest room on first floor, 1¼″ B.V. from lavatory, Teacher's rest room, and continue up vent flue with one 3″ B.V. and connect the 2″ vent from Medical Inspection Room closet, vent from lavatory, and 2″ vent from second floor slop sink, the B.V. from lavatories shall be 1¼″ W. I. carried exposed on toilet room walls, continue the 3″ B.V. up flue to attic space and connect with vent from Room No. 114 and carry through roof. Take a 1½″ W. I. vent from the lavatories in Boy's toilet, basement, and carry up in wall to ceiling of fan room, across ceiling and up chase and connect with lavatories on first and second floor with 2″ W. I. Continue this vent to attic space and connect to vent of main toilets.

Take a 1¼″ B.V. from drinking fountains in main corridor and carry up chase. The B.V. from the fountain near girl's main toilet shall vent into the main toilet vent in attic space. The vent from the drinking fountain near boy's shower room shall continue up chase and through roof.

Take a 4″ vent from ejector and carry up chase and through roof.

The exhaust vent from ejectors shall be connected with boiler stack.

Take a 2″ W. I. vent from waste line near blow-off and carry through roof.

All back vent connections from fixtures using the same vent stack shall connect with the stack

not less than three feet six inches (3′ 6″) above floor.

The waste line for each line of fixtures in each main toilet shall be continued as a circuit vent and shall be carried out through the roof.

Each of these main waste lines for basement shall have a relief vent, taken off in front of the first fixture, this relief vent shall be carried up to attic and connected. Take a similar relief vent from the main waste of the first and second floor toilets and connect with the above 3′6″ above floor.

LOCAL VENTS

The cast iron waste from each urinal shall have cast iron local vents carried up above the floors in vent spaces as shown.

All back vent piping shall be arranged to drip to wastes or traps, and all back vent pipes shall be connected so that no fixture can waste through them should the proper waste become stopped up.

When galvanized back vent pipes are run through roof, they shall be expanded to at least four inches (4″) in the attic.

All openings through the roof for vent pipes and soil stacks shall be flashed with four (4) pound sheet lead, extending twelve inches (12″) in all directions and turned down inside of pipe.

The top of all vent and soil risers shall be capped with Harrington's, or equal, all copper wire guards, securely fastened to pipe.

TESTING

Before fixtures are connected, the entire system

of soil waste, drain and vent piping in the building shall be filled with water to the top of vent pipes and allowed to stand for twelve hours for inspection after which, if the test is satisfactory to the Director of Schools, the trenches shall be filled and fixtures connected.

After the fixtures have been connected, the smoke test shall be applied to the satisfaction of the Director of Schools.

The water supply system hereinafter described, shall be tested to a hydrostatic pressure of eighty (80) pounds per square inch and made perfectly tight.

All tests shall be made to the satisfaction of the Director of Schools and a certificate of approval shall be obtained from the City Inspector, certifying that all work has been inspected and approved by him and that same conforms to all the city plumbing rules and regulations.

FLOOR DRAINS

All floor drains except those noted as clean-outs, shall be extra heavy cast iron similar to Clow's No. A-2130, 6"x6" galvanized, and shall be properly connected with the drainage system.

WATER SUPPLY

The Board of Education will bring a 4" C. I. water service through floor of meter room. This Contractor shall install a flanged meter spacer. This spacer will be furnished by the City Water Works Department, but this Contractor shall insert same in four-inch line and shall provide and install 4" gate valve on each side of same.

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Provide and install 4" valved by-pass around the meter or spacer.

From the meter location extend a four-inch (4") galvanized wrought iron line and make all connections as shown on drawings and hereinafter specified. Each branch from main and each riser throughout the work, with the exception of fire line risers, shall have a gate valve conveniently located.

This Contractor shall install at low points on water system three-fourths inch (¾") valved drain connections to sewer, so that the entire system may be drained.

The following valved cold water branches shall be extended from main:

The 4" line shall be carried up wall of meter room and along corridor ceiling. Take off a ¾" valved line for sill cock in Room No. 1.

Take off a 1¼" valved line into Room No. 19. Take off a 1" valved branch to kindergarten fixtures and continue with ¾" line to sill cock in Room No. 19.

Take a 1" valved branch to Domestic Science Room with valved branches to range boiler and fixtures.

Take off a 3" riser for hose reels near Library. Reduce main line to 3" at this point and continue along corridor ceiling.

Take off a 1¼" valved riser for drinking fountains near Library toilet room.

Take off a 2" valved riser to girl's toilets, Rooms Nos. 3, 103, and 203, with 1½" valved branch to each battery of fixtures.

From 2″ line in girl's toilet, basement, take off a 1¼″ valved line to Library toilet, Room No. 2. Take off valved branches for closet and lavatory in Library toilet. Take a 1″ valved branch to Library Boiler Room, leave ¾″ opening in line for Boiler and branch down wall and place ¾″ hose bibb over floor drain. Continue line ¾″ to sill cock in Room No. 2. Continue from the Library toilet room with 1¼″ valved riser to lavatories in Rooms No. 103 and 203.

From the 2″ line in Room No. 3, take a ¾″ valved branch for lavatory in Room No. 3.

From the 3″ line in corridor, take a 1″ valved branch to sump in ejector room. Leave 1″ opening in this line for air compressors.

From the 3″ line in corridor, take off a 2½″ valved branch for hot water storage tank. Leave a 1¼″ valved opening for receiving tank. Continue from 2½″ line with a ¾″ valved line for Engineer's closet and sink.

From 3″ line in corridor, take off a 3″ branch for fire riser.

Take off a 1″ valved line to slop sinks near main corridors on first and second floors, Janitor's closet.

Take off a 1¼″ valved line and carry just inside of boiler room wall for heating contractor.

From the 3″ line in Main Corridor, take a 3″ branch to Corridor No. 13, from this 3″ line take a 1¼″ valved riser to the Janitor's slop sinks in basement and first and second floors. From this riser take branches for fixtures in Room No. 115

and Room No. 214.

From 3″ line in Corridor No. 13, take a 3″ line to fire riser from this line, branch down corridor with ¾″ line for sill cock at end of Corridor No. 13.

Reduce the 3″ line in Corridor No. 13 to 2″. From this 2″ line in girl's shower room, take a ¾″ riser for Room No. 114. Place a valve in 2″ line and continue to shower heads with ½″ valves in each supply to each head (3 heads).

From 3″ line in Main Corridor, take a 1¼″ valved branch for drinking fountains.

From 3″ line in corridor, take a 2″ valved branch to boy's showers in Room No. 6 with ½″ valved branches to each head (6 heads).

From 3″ line in corridor, take a 3″ branch for fire riser.

From 3″ line in corridor take a 1″ valved branch and connect to fixtures in Lumber Room.

Reduce 3″ line in corridor to a 2″ line.

From a 2″ line in corridor, take a 2″ valved line to boy's toilet with 1½″ valved branches to each battery of fixtures. From this 2″ line take a ¾″ valve branch to lavatories in Boy's Toilet No. 10.

From 3″ line in corridor, take a 1¼″ valved riser to lavatories in boy's toilet No. 110 and No. 210.

All sill cocks shall have valve and drain valve just inside the wall.

The lines to the drinking fountains shall be covered with 1″ approved wool felt covering where concealed.

The four (4) three-inch (3″) fire line risers shall be without valves and shall have 3″ hose reel connection looking out 6′0″ above floor.

Provide a 1″ temporary water feed line for boilers if so necessary, carry this line to just inside boiler room wall, Heating Contractor to make necessary connections to boilers.

HOSE REELS

Hose reels shall be installed where indicated, as follows:

Basement—Four (4).

First Floor—Four (4).

Second Floor—Four (4).

Provide and install the reels in complete working order; same shall be "Cliff Safety Automatic Hose Reels" for fifty (50) feet of hose. All hose reels shall be finished in aluminum bronze, with brass parts nickel plated.

Provide and connect the hose; same shall be 2″ unlined linen hose, conforming in all respects to the requirements of the National Board of Fire Underwriters, and each section of hose shall bear the Underwriters' label, indicating that it is approved by them. Each hose shall be in fifty (50′) foot lengths, without couplings.

SILL COCKS

Provide seven (7) first-class, loose-key, nickel-plated sill cocks for three-fourths-inch (¾″) pipe and three-fourths inch (¾″) hose, and install same where indicated.

HOT WATER HEATERS

All cold water, hot water and hot water return connections shall be made to hot water heater as specified.

The storage tank will be furnished and set up in place by the Heating Contractor; all connections to tank shall be properly valved.

HOT WATER PIPING AND RETURN SYSTEM

Hot water for general house service shall be supplied from storage tank installed by the Heating Contractor.

The Plumbing Contractor shall take a 2½" valved supply line from storage tank, leaving a 1¼" valved opening between storage tank and 2½" valve, for supply to receiving tank, the Heating Contractor will make the necessary connection to receiving tank from this 1¼" valve From the 2½" line, take a ¾" valved line to Engineer's sink.

From the 2½" valve, continue 2½" line to main corridor branching to right with 2" supply line and to left with 1½" supply line.

From the 1½" line, take a ¾" valved riser to Teacher's toilet No. 218.

From 1½" line, take a 1" valved line to Domestic Science Room No. 18, with valved branches to range boiler and fixtures. The valves are to be so arranged in both hot and cold water that boiler can be cut out and the fixtures supplied with hot water from the storage tank.

Reduce main in corridor to 1¼", take a ¾"

valved riser to fixtures in Room No. 118. From the end of this 1¼" line, take a ¾" return to point near Engine Room entrance.

Continue the 2" supply near engine room entrance and take off a 1" valved riser to slop sinks in Janitor's Closets, near main corridors on first and second floors, with valved branches to each fixture.

From the 2" line in main corridor, take a 2" valved branch to Corridor No. 13. From this branch, take a 1¼" valved riser for Janitor's slop sinks, first and second floor, and Principal's toilet 115, and Medical Inspection Room No. 214. Continue 2" line to girl's shower room. Take a ¾" valved riser to toilet of Room No. 114. Place a 2" valve and continue 2" line to showers with ½" valved supplies to each head (3 heads). Return from end of showers with ¾" line to main corridor.

From the 2" line in Main Corridor, take a 2" valved branch to Boy's Shower Room with ½" valved branches to each shower head (6 heads). Reduce the 2" line at end of showers to ¾" and carry to Main Corridor. Return down corridor rereceiving the ¾" line at Corridor No. 13 and continue to point near entrance of Engine Room. Connect the ¾" return from the 1½" supply branch and carry to storage tank with ¼" return line. Place valves in hot water return lines at all necessary points.

All lines of hot water piping shall have returns as shown.

The return shall be connected to the tank through check and gate valves.

All the above hot water piping that is run in inaccessible locations shall be seamless brass of iron pipe size, B. & B. make or equal. Fittings for same shall be beaded standard gray cast iron for pipe over 1" in diameter and heavy beaded rough brass, iron pipe size for pipe 1" or smaller in diameter.

All exposed piping in toilet room, both hot and cold, except that run on ceilings, shall be heavily nickel-plated seamless brass of iron pipe size with N. P. brass fittings cut with full thread.

All piping shall be installed so as to provide ample provisions for expansion.

All valves of hot and cold water supplies shall have polished brass tags with name of line or fixture stamped on; tags shall be large enough so that the name shall be clearly legible.

Connect all the supply piping with the various fixtures so as to leave them in complete working order ready for use.

COVERING

Cover all exposed cold water pipes in the basement with 1" wool felt approved covering and secure neatly and permanently to pipes with lacquered brass bands. The covering shall have an extra jacket of 7-oz. canvas in unbroken lengths between fitting and branches with seam on top of pipe. Cover the fittings neatly with asbestos cement, shape to size of covering and jacket same with canvas of same kind and quality as that on the covering.

Wool felt covering shall be asbestos lined for hot

water pipes and painted with asphaltum paint on the inside for cold water piping.

All exposed hot water and circulating pipes and fittings in basement shall be covered as above.

All hot water and circulating pipes in tempered air ducts shall be covered as above, except that covering shall have standard jacket and bands.

The lines to the drinking fountains shall be covered with air cell covering when concealed.

SLATE WORK

Provide and set all slate stalls, screens and vent enclosures in Rooms Nos. 2, 3, 6, 10, 14, 16, 103, 110, 118, 203, and 210, and all fittings for same.

Stalls and screens shall be of best quality black Bangor ribbon slate, cut true, rubbed to a fine smooth surface and accurately fitted and put together with perfect joints, all according to Plans and Details.

All measurements for slate work shall be taken at the building, by the Contractor for same.

All doors in slate work will be provided and hung by the Carpenter Contractor, but the Plumbing Contractor must furnish all hinges, bolts, strikes, etc., and must do all drilling and cutting of slate necessary to set them.

All ends and backs that set against walls shall be one-inch (1") thick, all other slate shall be 1⅛"- and 1¼"-thick.

JOINTING SLATE WORK

The Contractor shall do all cutting and fitting necessary for the erection and setting of slate. Any drilling or cutting necessary for the erection and

completion of other work in connection with slate work shall be done by this Contractor, without extra charge, as directed. The setting of all slate work shall be done in the most careful manner. All slate work shall be thoroughly and completely imbedded in cement and, as far as possible, shall be secretly anchored with copper anchors. Surface anchorage for slate shall only be used where absolutely necessary. Said anchorage shall consist of nickel-plated brass screws.

All work shall be set true and plumb and shall present an even and perfect alignment.

All slate work shall be made to conform to the general and detail drawings; vent enclosures shall be made air-tight. Holes for local vents of water closets shall not be cut till closets are on the job.

The Contractor will note that shower stalls will extend down into shower basins as shown; joints at floor line shall be made with glycerine and litharge.

All metal fittings used in connection with slate work shall be finished nickel-plated brass. All standards, braces, rails, etc., for enclosures shall be one and one-fourth-inch (1¼") iron pipe size, nickel-plated brass pipe, with all necessary nickel-plated brass fittings to match. All slate work shall furthermore be thoroughly clamped together with heavy approved nickel-plated brass clamps, at intervals not to exceed twenty-four inches (24") on centers.

All slate partitions and stalls shall have the top rails extending along the entire front and returning to wall where shown or required.

All the above fittings shall be heavy brass, nickel-plated and polished; all except the standards and rails shall be cast.

FIXTURE CONNECTIONS

All hot and cold water connections to all lavatories and sinks shall be provided with proper air chambers.

Hot and cold water branch supply pipes having three (3) or less fixtures shall be three-fourths inch (¾") diameter; more than three (3) and less than nine (9) fixtures shall be one inch (1") and for nine (9) and more shall be one and one-fourth inch (1¼") except otherwise noted for water closets and showers.

For water closets the following sized water connections shall prevail:

From 1 to 2 closets, inclusive, ¾" pipe.
From 3 to 4 closets, inclusive, 1 " pipe.
From 5 to 6 closets, inclusive, 1¼" pipe.
From 7 to 8 closets, inclusive, 1½" pipe.
From 9 to 12 closets, inclusive, 2 " pipe.

The above is for closets with tanks; if Flushometer type closets are used for the six main toilets, the supply shall be a 4" header for each battery of water closets in the vent space with 1¼" valved branches to each closet. The 4" header shall be supplied from the 2" riser.

For each group of showers in basement, two-inch (2") hot and cold water lines shall be extended and continued full size to the last fixture.

Water supply to single fixture shall in no case be less than ½".

FIXTURES

All fixtures that are specified by catalogue number are intended as a standard only. Other fixtures equal in all respects to those specified, and acceptable to the Director of Schools, may be used, provided a list giving plate numbers and manufacturer's name is submitted with the bid.

The fixtures shall be a part of the plumbing contract and shall be bought and paid for by the Contractor for the plumbing, but the manufacturer supplying these fixtures will be required to give a bond to the Board of Education of Toledo, Ohio, guaranteeing the delivery of all fixtures in perfect condition, not later than January 1, 1926, said bond shall guarantee the Board of Education against damages as follows:

Twenty-five dollars for each and every day after above date, that elapses before the delivery of all or any of the fixtures, which sum or sums shall be deducted from the contract price of said fixtures, as and for liquidated damages.

SCHEDULE OF FIXTURES

BASEMENT

12 Water Closets
1 Closet Tank
9 Urinals
1 Urinal Trough
4 Drinking Fountains
3 Slop Sinks
5 Lavatories
9 Showers
2 Sinks
1 Range Boiler and Heater

FIRST FLOOR

22 Water Closets
11 Urinals
7 Lavatories
5 Drinking Fountains
2 Slop Sinks

SECOND FLOOR

20 Water Closets
11 Urinals
6 Lavatories
4 Drinking Fountains
2 Slop Sinks

WATER CLOSETS

All water closet bowls shall be of best hard fired vitreous ware stamped with the trade name of the manufacturer under the glaze. Glaze shall be white without crazing, discoloration, chips or other flaws. A fractured piece of the material composing the

bowl shall not absorb or show discoloration by red ink after being immersed in same for one hour. Bowls shall be oval, syphon jet, with concealed jet arm, with heavy rolled flush rim. Bowls of all closets of Rooms Nos. 3, 103, 203, 10, 110 and 210 shall have three-inch (3″) raised rear seat vent with heavy cast brass, nickel-plated collars bolted to slate backs of stalls.

All bowls shall have three-inch (3″) limb and outlet, and waterway shall pass a ball of not less than two inches (2″) in diameter. Water surface in bowl shall not be less than eight and one-half by twelve inches (8½″x12″), depth of seal not less than two and one-half inches (2½″), outside width of bowl not less than fourteen inches (14″), height of bowls not over thirteen inches (13″) for Rooms Nos. 3, 103, 203, 10, 110 and 210, and toilet room of Room No. 118 and not over 16″ elsewhere.

All closets shall have selected oak saddle seats, without covers, golden oak cabinet finish, one and one-half inch (1½″) thick, reinforced with N. P. cast brass plate all around on underside and with two heavy mushroom bumpers at front, and nickel-plated brass box hinge. Give alternate for whale-bone-ite seats No. 16-9, ebony.

The closets of Rooms Nos. 3, 103, 203, 10, 110 and 210 shall have automatic seat operating valve for pressure tanks or lever handle valve for Flushometer type valve.

The Board of Education wants proposals based on above closets with lever operation valve of the

Flushometer type, and on steel pressure tanks operated with seat valve.

If the Flushometer type is used, same shall be equal in all respects to the Sloan all metal lever handle valve, with 1¼" gate valves in vent space.

If pressure tanks are used, they shall be eight by twenty-four inches (8"x24") galvanized drawn steel closet tank, supported in vent spaces on cast iron japanned brackets and secured to slate backs by means of brass bolts with N. P. cap nuts and washers. The valve shall be of heavy No. 1 brass with all exposed part N. P. and polished. Valves shall have ½" branch supplies with heavy rough brass lever handle stop cocks.

The backs of these water closet enclosures shall be provided with special N. P. cast brass, double rubber seat bumper, attached to slate by brass bolts with N. P. cap nuts and washers.

All parties bidding on this work shall provide a sample of the closet and valve they propose to furnish; said sample shall be connected up with the proper water supply for the fixtures and the water turned on.

Samples shall be set up at some place in the City of Toledo convenient for the Board of Education.

Closets of toilets of principal's office, rest rooms, medical inspection room, and boiler room shall be as before specified, regular height, without seat vent, but shall have low down tank with N. P. ⅜" I. P. size brass supplies with valves

Closets of toilet of Room No. 118 shall be as before specified, not over thirteen (13") high, and

with low down tank capacity not less than seven gallons with N. P. brass supply with valve.

All low down tanks shall be of cast iron, enameled inside and outside, with N. P. brass lever and china handles. Tanks shall have copper floats and re-fill chambers, compounded lever ball cocks with ten (10) oz. copper balls and shall be guaranteed against siphonage and leakage and shall be noiseless in operation.

The water closet connection shall be made of heavy pattern screw jointed brass floor flanges, with cast iron nipples of proper length, caulked to iron soil pipe fittings. Closets shall be bolted to the brass flanges with N. P. brass bolts. Joints between closets and flanges shall be made absolutely gas and water tight with special molded gaskets and red lead putty.

Approved screw joint connections may be made between the water closets and soil joints in lieu of the connections specified above, if so desired by the Contractor and approved by the Director of Schools.

URINALS

Provide and set in Rooms Nos. 10, 110 and 210 three (3) batteries of urinals. Urinals shall be class "B," solid porcelain, 14⅞" wide by about 40" high.

The Plumbing Contractor will note that urinals will set in slate stalls and if the size of urinals varies from the detail as shown, the Plumbing Contractor shall provide stalls to fit the urinals furnished, without extra cost.

Urinals shall be set with the top of lip extension

flush with floor, and the front of urinals, below this point shall form a sharp arris.

Backs and sides of urinals shall be ground to fit against the slate; top and fronts shall be glazed.

All joints between urinals and slate shall be neatly filled with approved white cement.

The urinals shall not be provided with local vents cast in the body of same, but shall be mounted as shown in detail, with three-inch (3") local vent taken off of drain lines.

Each urinal shall have an N. P. cast brass spray jet flushing device with lock nut and coupling for connection to a three-fourths-inch (¾") flush pipe, guaranteed to flush all sides of the urinal.

The waste outlet connection from each urinal shall have a heavy pattern cast brass plug, with nickel-plated bee-hive strainer, with brass lock nut on under side of urinal and brass extension for caulked joint connection into three-inch (3") cast iron Y, with which each urinal shall be provided.

Each battery of urinals shall be provided with automatic flush tanks, as follows:

There shall be one tank for every three urinals. The tank shall be mounted in vent space back of urinals and shall be of sufficient capacity to furnish one gallon of water for each urinal at each flush. Tanks shall be galvanized cast iron, with iron tank supports mounted in vent space in rear, and shall have galvanized sheet metal cover not less than 20 gauge. Tanks shall be automatic in operation and provided with fixed siphon flushing device equal and similar to Columbus Brass Mfg. Co.'s

double tube automatic syphon tank valve. Each tank shall have an half-inch (½") rough brass handle stop cock, and in addition thereto a regulating supply cock, so that the frequency of flush may be regulated as desired.

The flush pipe connection between tanks and urinals, where exposed, shall be of nickel-plated brass, with proper distributing fittings and branch connections to each urinal, together with the required number of nickel-plated brass pipe holders for securing same.

Slate work of urinals is included in the contract with all other slate of toilets.

LAVATORIES

The Lavatories of Rooms Nos. 3, 10, 110, 103, 203 and 210, shall be similar to Mott's Fig. 4315A extra heavy vitreous lavatories, 20" x 18", with integral backs 6" high, and wall supports. Basins shall have all open patent overflow and Mott's Fig. 4318A No. 2 Nassau N. P. waste.

The lavatories of above rooms shall have one and one-quarter-inch (1¼") N. P. brass trap iron pipe size, to waste to wall.

These lavatories shall be supplied with cold water only, through H. Mueller Mfg. Co. D-11909 self-closing faucets with metal lever handle with solid shank. The supply shall be ½" iron pipe size valved N. P. brass pipe, from wall.

The lavatories of Rooms Nos. 2, 118, 115, 114 and 214 shall be same as above, but shall be supplied with both hot and cold water.

All valves in supplies shall have loose keys, and shall have N. P. brass flanges at floor or walls.

SHOWERS

The nine showers in Rooms Nos. 6 and 14 shall be similar to Speakman Supply & Pipe Co.'s Fig. 895, with non-scalding regulator valve, strainer, unions and cast brass needle head, with removable face and adjusting ball joint, with half inch (½") supply pipes from overhead.

The three showers in Room No. 14 shall have the needle head set five feet six inches (5'6") above the floor.

Each shower stall of Rooms Nos. 6 and 14 shall be provided with approved canvas curtains suspended from overhead bracing by means of N. P. brass rings.

Each shower stall of Room No. 14 shall be provided with American Foundry and Machine Co.'s Fig. 402 drains and trap with N. P. brass strainer cover and three-inch (3") outlet for iron pipe connections.

The shower stall of Room No. 6 shall be provided with floor drain, etc., as above, but 4" outlet for iron pipe connections.

SINKS

Provide and set up in Room No. 18 a guaranteed porcelain enameled combination sink and laundry tray, with integral back and hardwood drain board. Combination shall have standard under laundry tray and leg under sink. Faucet holes for laundry tray shall be under drain board. Fixture shall waste to floor through 1½" brass trap and I. T. size waste.

For Harvard School Building

Supply with hot and cold water through ⅝" N. P. Compression pattern faucets with box flanges. Note supplies are ¾".

Provide and set up in Engineer's toilet a galvanized iron sink, with integral back, thirty by twenty inches (30"x20"), with one and one-half inch (1½") heavy brass trap and waste to wall and supply with hot and cold water through faucets as above. Cold water faucet shall have hose connection. Supplies shall be galvanized iron brought down exposed from ceiling to a point below sink and then turned up to faucets and shall have brass drain valves in low point.

Provide and set up in Room No. 18 two slop sinks similar to Standard Mfg. Co., Plate P7235, enameled inside, size 16"x20", with two-inch (2") brass waste plug with cast brass strainer. Sinks shall be provided with adjustable iron trap standards with clean out, to waste to floor, with heavy threaded flanges and without vents, and shall be supplied with hot and cold water through N. P. Combination Compression Supply fitting shown with cut. Note the supplies are ¾" with valves

Provide and set in each Janitor's closet, a poreclain enameled iron roll rim slop sink, similar to Clow's Fig. S-991, 22"x18"x12" deep with integral back, and trap standard, with N. P. strainer, N. P. ⅝" extended Compression pattern faucets with box flanges.

Trap standards shall have heavy brass floor flanges, 3″ female threads, brass bolts, cap nuts and washers, and composition gaskets. Trap standards shall have clean-out plugs.

DRINKING FOUNTAINS

Provide and set the drinking fountains where shown. Same shall have round vitreous ware receptors, set away from wall. They shall have heavy plain N. P. brass brackets and 1½″ N. P. heavy brass trap with waste and B. V. to wall. Receptors shall each have one N. P. brass bubbling cup with ⅜″ N. P. iron pipe size, brass supply to each cup. Each supply shall have Glauber N. P. brass, lock shield stop valve, and a self-closing metal lever handle N. P. brass stop valve; the stop valve shall be set with the handle below the receptors.

The bubbling cups shall be N. P. brass, non-squirt and with the valves shall be equal to and similar to those made by the Toledo Mfg. & Supply Co.

Fountains of basement and first floor shall be set 24″ and of second and third floor 30″ above floor. Fountain of Room No. 118 shall be set 20″ above floor.

RANGE BOILER

Provide and set up in Room No. 8 at point shown near the range location, one 30 gallon combination range boiler and gas water heater, Basley Morley Co.'s Royal Automatic. Boiler shall be properly connected with the gas and hot and cold water supplies (¾″) each and shall be provided with draw-off cock and cast iron standard.

Provide and connect up the vent pipe for the above. Same shall be of planished Russian iron and shall be connected with the vent pipe of range, and shall be thoroughly secured in position.

GAS PIPING

All gas fitting shall be similar to A. M. Beyer's or Reading standard, full card weight, black, wrought iron pipe, cut with clean, sharp threads, and with all burrs removed. All piping under floor shall be galvanized.

Fittings shall be heavy pattern, malleable galvanized iron.

Pipe and fittings shall be screwed together with red lead and litharge and proven tight.

The owner will bring the service into Room No. 1; this Contractor shall install proper meter connections with brass stop cocks.

From the meter take a 1¼" line under floor and down duct.

Distribute as shown with ¾" branch outlets in floor as shown.

TEST

All piping shall be tested to a pressure of 15 lbs. per square inch, and shall hold for a period of two hours.

The Plumbing Contractor shall keep the entire work as included in this Specification and each and every part thereof in perfect condition, usual wear and tear excepted, for a period of one year from date of final acceptance of the work and shall

remedy without expense to the Board of Education, all defects whether in material, workmanship, or operation that may become apparent during this period.

All water closets in the building shall be covered by this guarantee for a period of three years.

The Contractor's bond shall cover these guarantees.

COPY OF CONTRACT AND BOND

THIS AGREEMENT, made the_____

day of _____in the year one

thousand nine hundred and_____by and

between _____

_____

_____

_____

party of the first part (hereinafter designated the Contractor), and the BOARD OF EDUCATION of the City School District of the City of Toledo, Ohio, party of the second part (hereinafter designated the Board), the "Director of Schools" meaning the Director of Schools of Toledo, Ohio.

WITNESSETH, that the Contractor, in consideration of the agreements herein made by the Board, agree with the said Board as follows:

ARTICLE I. The Contractor shall and will provide all the materials and perform all the_____

_____

_____

work in the construction of a school building, known as the _____

_____

_____

_____

_____in Toledo, Ohio, as shown on the Drawings and described in the Specifications prepared by the Department of Architecture of the Board of Education, which Drawings and Specifications are identified by the signatures of the parties hereto, and together with said bidders' proposals as accepted by the Board become hereby a part of this contract as fully as though expressly embodied herein.

Article II. It is understood and agreed by and between the parties hereto that the work included in this contract is to be done under the direction of the Director of Schools and that his decision as to the true construction and meaning of the Drawings and Specifications shall be final. It is also understood and agreed by and between the parties hereto that such additional Drawings and explanations as may be necessary to detail and illustrate the work to be done are to be furnished by the said Board, and they agree to conform to and abide by the same so far as they may be consistent with the purpose and intent of the original Drawings and Specifications referred to in Article I.

It is further understood and agreed by the parties hereto that any and all Drawings and Specifications prepared for the purpose of this contract by the said Architect are and remain the property of the Board of Education, and that all charges for the use of the same, and for the services of said Architect, are to be paid by the said Board.

ARTICLE III. No alteration shall be made in the work except upon written order of the Director of Schools; the amount to be paid by the Board or allowed by the Contractor by virtue of such alteration to be determined and stated in said order.

ARTICLE IV. The Contractor shall provide sufficient, safe and proper facilities at all times for the inspection of the work by the Director of Schools, the Architect or his authorized representatives; shall, within twenty-four hours after receiving written notice from the Director of Schools to that effect, proceed to remove from the grounds or building all materials condemned by him, whether worked or unworked, and to take down all portions of the work which the Director shall by like written notice, condemn as unsound or improper, or as in any way failing to conform to the Drawings and Specifications and shall make good all work damaged or destroyed thereby.

ARTICLE V. Should the Contractor at any time refuse or neglect to supply a sufficiency of properly skilled workmen, or of materials of the proper quality, or fail in any respect to prosecute the work with promptness and diligence, or fail in the performance

of any of the agreements herein contained, such refusal, neglect or failure being certified by the Director of Schools, the Board shall be at liberty, after twenty-four hours' written notice to the Contractor to provide any such labor or materials, and to deduct the cost thereof from any money then due or thereafter to become due the Contractor under this contract; and if the Director of Schools shall certify that such refusal, neglect or failure is sufficient ground for such action, the Board shall be at liberty to terminate the employment of the Contractor for the said work and enter upon the premises and take possession, for the purpose of completing the work included under this contract, of all materials, tools and appliances thereon, and to employ any other person or persons to finish the work, and to provide the material therefor; and in case of such discontinuance of the employment of the Contractor_____ _____ shall not be entitled to receive any further payment under this contract until the said work shall be wholly finished, at which time, if the unpaid balance of the amount to be paid under this contract shall exceed the expense incurred by the Board in finishing the work, such excess shall be paid by the Board to the Contractor; but if such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Board. The expense incurred by the Board as herein provided, either for furnishing materials or for finishing the work, and any damage incurred through such default, shall be audited and

certified by the Director of Schools whose certificate thereof shall be conclusive upon the parties.

ARTICLE VI. The Contractor shall complete the several portions, and the whole of the work comprehended by this agreement by and at the time or times hereinafter stated, to-wit:

All work contemplated in this contract shall be completed on or before _____ and the Contractor shall forfeit and pay to the Board the sum of _____ _____ as liquidated damages for each and every day beyond and after _____ during which said work shall be delayed or not completed and any such sum shall be deducted from any payments due said Contractor.

ARTICLE VII. Should the Contractor be delayed in the prosecution or completion of the work by the act, neglect or default of the Board, of the Archiect, or of any other Contractor employed by the Board upon the work, or by any damage caused by fire or other casualty for which the Contractor is not responsible, or by general strikes, or lock-outs caused by acts of employees ,then the time herein fixed for the completion of the work shall be extended for a period equivalent to the time lost by reason of any or all causes aforesaid, which extended period shall be determined and fixed by the Director of Schools; but no such allowance shall be made unless a claim

therefor is presented in writing to the Director of Schools within forty-eight hours of the occurrence of such delay.

ARTICLE VIII. The Board agrees to provide all labor and materials essential to the conduct of this work not included in this contract in such manner as not to delay its progress, and in the event of failure so to do, thereby causing loss to the Contractor, agrees that it will reimburse the Contractor for such loss, and the Contractor agrees that if he shall delay the progress of the work so as to cause loss for which the Board shall become liable, then he shall reimburse the Board for such loss.

ARTICLE IX. It is hereby mutually agreed between the parties hereto that the sum to be paid by the Board to the Contractor for said work and materials shall be _____

_____

_____

_____

_____

_____

subject to additions and deductions as hereinbefore provided, and that such sum shall be paid by the Board to the Contractor, in current funds, and only upon certificates of the Architect approved by the Director of Schools, based on monthly estimates of

_____ (_____%)

per cent as the work progresses.

The final payment shall be made within_____

_____days after the completion of the work included in this contract and all payments shall be due when certificates for the same are issued.

If at any time there shall be evidence of any lien or claim for which, if established, the Board or said premises might become liable, and which is chargeable to the Contractor, the Board shall have the right to retain out of any payments then due or thereafter to become due any amount sufficient to completely indemnify it against such lien or claim. Should there prove to be any such claim after all payments are made, the Contractor shall refund to the Board all moneys that the latter may be compelled to pay in discharging any lien on any said premises made obligatory in consequence of the Contractor's default.

ARTICLE X. The Contractor shall make prompt and full payments to all persons furnishing labor or materials under this contract, and save the Board harmless from all costs resulting from his failure so to do.

It is further mutually agreed between the parties hereto that no certificate given or payment made under this contract except the final certificate or final payment, shall be conclusive evidence of the performance of this contract, either wholly or in part and that no payment shall be construed to be an acceptance of defective work or improper materials.

For Harvard School Building

ARTICLE XI. The Board shall during the progress of the work maintain insurance on the same against loss or damage by fire----------

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the policies to cover all work incorporated in the building, and all materials for the same in or about the premises, and to be made payable to the parties hereto, as their interests may appear.

The said parties for themselves, their heirs, successors, executors, administrators and assigns do hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands and seals, the day and year first above written.
In presence of

---------- ----------

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THE BOARD OF EDUCATION, of the City School District, of the City of Toledo, Ohio.

By ----------
Director of Schools

COPY OF BOND

KNOW ALL MEN BY THESE PRESENTS,

That _____as principal, and

_____

as sureties, are held and firmly bound unto the Board of Education of the City School District, of the City of Toledo, Ohio, in the sum of_____ for the payment of which we hereby jointly and severally bind ourselves, our heirs, executors and administrators, successors and assigns.

Signed and Sealed this_____day of_____

THE CONDITION OF THIS BOND IS SUCH

That whereas the said _____

was on the_____day of_____awarded a contract for the_____

_____

_____building in the City of Toledo, Ohio, and by the terms of said Contract said _____ agreed among other things to complete the said_____

_____and to hold the said Board of Education blameless; and also agreed that

said Board shall not in any manner be liable for any loss or damage that may happen to said work or material, or any part thereof, during the time of construction, and shall not be liable for any injury that may occur or may happen to any party working in, around or about said work, or who may be injured in any manner or under any circumstances during the .....
.....and save harmless the Board of Education from any and all labor and material liens.

NOW THEREFORE, If the said_____ shall well ,truly and faithfully discharge and perform all and singular the terms of said contract and complete said _____
on or before _____
and hold the said Board of Education blameless from any damages or loss, then this obligation is to be null and void; otherwise to be and remain in full force and effect. And said sureties expressly agree to and waive any notice of any alterations or modifications that may be made in the Contract; Plans or Specifications after the Contract is awarded.

WITNESS OUR SIGNATURES, This_____
day of _____

Signed in the presence of:	Principal:
_____	_____
_____	_____
(Two witnesses for principal.)	Sureties
	_____
	_____

FORM OF BLANK PROPOSAL UPON WHICH ALL BIDS ARE TO BE MADE

Bidders are warned that all bids which are deficient in any of the requirements stipulated in the public advertisement, "NOTICE TO CONTRACTORS," may be rejected as informal.

BIDDERS' PROPOSAL

To the Board of Education of the City School District of the City of Toledo, Ohio.

Gentlemen:

The undersigned do hereby declare that we have visited and examined the building site, and have carefully examined the Plans, Specifications, details and form of contract for the ----------

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----------prepared by the Department of Architecture, of the Board of Education, Toledo, Ohio, Edwin M. Gee, Architect.

We hereby propose to furnish all labor, tools and materials requisite to the construction of all work under the following heads, only so far as filled out

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further agree that should bid be accepted---------- will enter into a contract for the faithful performance of the labor, and furnishing of all materials included in the bid and will furnish the bond required. and expressly agree to fully comply with the Plans and Specifications.

Specifications for Labor and Material

1. EXCAVATING AND GRADING

_____Dollars_____ ($_____)

Total as specified for the sum of_____

_____Dollars_____Cents ($_____)

Unit price per cu. yard for excavation below the depth required by the plans_____

_____Dollars_____Cents ($_____)

2. DRAINAGE

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

3. CONCRETE WORK

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

Unit price per lb. for reinforcing steel in place _____

_____Dollars_____Cents ($_____)

Unit price per sq. ft. for wood forms erected and wrecked _____

_____Dollars_____Cents ($_____)

Unit price per cu. ft. for concrete in place_____

_____Dollars_____Cents ($_____)

Unit price per sq. ft. for cement mortar finish

_____Dollars_____Cents ($_____)

4. **WATER-PROOFING**

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

5. **STRUCTURAL STEEL**

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)
Unit price for Structural Steel in place_____
_____Dollars_____Cents ($_____)
Unit price for Cast Iron in place_____
_____Dollars_____Cents ($_____)

6. **ORNAMENTAL IRON**

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

7. **CUT STONE**

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

8. **BRICK WORK (Solid Brick Walls)**

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

Unit price per M (figuring 18 bricks per cu. ft. of wall), for estimating additions and deductions _____

_____Dollars_____Cents ($_____)

9. **BRICK WORK—(With Hollow Tile Walls)**

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

10. **MARBLE AND TILE**

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

For Harvard School Building

11. LATH AND PLASTER

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

12. SHEET METAL AND ROOFING

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

13. CARPENTER WORK

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

14. HARDWARE

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

15. GLASS AND GLAZING

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

16. PAINTING

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

17. STEEL SASH AND FRAMES

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

18. HEATING AND VENTILATING

Labor _____
_____Dollars_____Cents ($_____)
Material _____
_____Dollars_____Cents ($_____)
Total _____
_____Dollars_____Cents ($_____)

For Harvard School Building

19. AUTOMATIC TEMPERATURE REGULATION

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

20. ELECTRIC WIRING

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

21. PLUMBING AND GAS FITTING

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

22. BID FOR THE WHOLE

(Work complete including all heads bid upon)

Labor _____

_____Dollars_____Cents ($_____)

Material _____

_____Dollars_____Cents ($_____)

Total _____

_____Dollars_____Cents ($_____)

23. Deduct from, add to, the above amount.....
_____Dollars_____Cents ($_____)
if Hollow Tile, as specified, is used in place of
Solid and Hollow Brick_____

24. Deduct from, add to, the above amount.....
_____Dollars_____Cents ($_____)
if Carney Brick Cement is used_____

_____herewith enclosed cash, check, bid
bond for $_____

_____

Date _____

Toledo, Ohio

Parties interested in the foregoing proposal:

_____

_____

_____

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